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TO CORRESPONDENTS.

W. A.—*The stamped edition of the* Journal *is intended for subscribers receiving it through the post. The trade and London subscribers are supplied with the unstamped edition, unless specially ordered to be stamped.*

NOTICES.

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Circular to Gas Companies.

The success which has attended the application to Parliament for a bill to incorporate a new gas company for lighting Torquay, ought to awaken the attention of all other gas companies of the larger class who are carrying on their operations without statutory powers; and it is somewhat surprising that so few of those in such a position should have applied for acts during the present session. The decision of the Court of Queen's Bench, in the Sheffield case, has settled the question that streets and roads cannot be lawfully broken up for the laying and repairing of pipes without statutory authority; and hundreds of gas companies are now liable to have their operations suspended or materially interfered with by common informers, or any disappointed or dissatisfied individual—or, as in the case of Torquay, be compelled to sell their works on whatever terms a rival may be inclined to offer for them.

The inhabitants of Torquay are divided into two parties, or, perhaps, factions—the Palkites and the Careyites, so named from the two families owning the entire of the land of the town and neighbourhood. A gas company, composed of Palkites, acting under a trust deed, has lighted the town for some years, and the same party has carried the election of a large majority of the local Board of Health. The town has rapidly increased of late years, and outgrown the capabilities of the gas works; and it is admitted on all hands that the supply of gas has been often deficient. The Careyites profited by this state of things to give notice, in November last, of their intention to apply to Parliament for an act to incorporate a new company, and came before the committee under the circumstances and with the case reported in another column. It does not appear that the scheme had met with much support from the Torquay public, or that many of its shares had been taken up; parties were, however, found to prosecute the bill, and after two days' inquiry the old company struck its flag, and resolved to accept the sum offered for its works. Parliament had to make its election between passing the bill or continuing the supply of gas in the hands of parties without the necessary powers for carrying on their works; and under these circumstances there is no doubt the old company exercised a wise discretion in selling its property. They ought, on the appearance of the notice of the new company, themselves to have given notice of their intention to apply to Parliament for an act, and would then have had a *status* before the committee. As it is, the Palkites of Torquay have suffered a defeat, which ought to be a warning to every unincorporated gas company of Great Britain.

Dr. Letheby's bold assumption of the functions of a gas engineer, in hazarding an opinion as to the pressure at which gas should be delivered to the public in order to ensure an efficient supply, is strongly emblematical of that reckless spirit with which a witty divine once charged one of our most illustrious living statesmen. The Mile-end "toxicologist" is as much out of his element in dealing with such a question as Lord John Russell would have been had he assumed the command of the Baltic fleet. Dr. Letheby unhesitatingly tells the Commissioners of Sewers, in one part of his last report, that "gas ought never to be delivered at less than an inch of water pressure"; and a few lines further he innocently admits that a governor is employed at one of the places where the experiments have been carried on, to reduce the pressure of the City cannel gas to a maximum of four-tenths of an inch of water, and a minimum of two-tenths, thus practically contradicting the opinion given in the passage we have quoted. Neither has his charge against the Chartered Gas Company, of supplying gas at such variations between the extreme pressures as to subject the public to inconvenience, any better foundation—if his own table of pressures is to be relied on, the extreme variations in which are

City Company	7 tenths.
Great Central	8 ,,
Commercial	3 ,,
Chartered, Brick-lane	6 ,,
,, Curtain-road	6 ,,

Instead of there being any solid ground for reproach against the Chartered Company on this score, a gas engineer would have given its officers credit for so regulating their pressure as to cause the smallest possible waste of gas while affording an ample supply. One of Wright's registering pressure gauges fixed on the Great Central main in the vicinity of Temple-bar, another on that of the Chartered in Cornhill, and another on the same company's main in Cheapside, will be far more effectual means of controlling the supply of gas to the public lights than observations such as Dr. Letheby has made; and if the gauges indicate a minimum pressure of half an inch of water, the Commissioners may rest assured that the supply of gas has been ample, Dr. Letheby's opinion to the contrary notwithstanding.

We observe with pleasure the steady progress now making towards the employment of gas as a calorific agent for all the requirements of domestic comfort. The invention of Messrs.

Bachhoffner and Defries, in particular, seems at length, under the untiring efforts of the latter gentleman, to have put on an aspect which leaves nothing to be desired by those who can afford to secure a largely increased convenience at a moderately increased cost. The Defries Gas Fire cannot be distinguished in any way whatever from an ordinary fire, except attention be paid to the absence of soot, dirt, and ashes, or an opportunity is afforded of witnessing the ease and rapidity with which it can be kindled and extinguished.

Differing considerably from the above is the elegant contrivance of Messrs. Smith and Phillips, of Snow-hill. In this the appearance of fire is not real, as in the Defries fire, but merely artistic. Messrs. Smith and Phillips arrange a number of small pieces of glass—technically called "cullet," "culot"—by which the light from the gas is broken and dispersed in such a manner that, on passing through a red glass screen placed in the front of the grate, an effect results exactly similar to that of a common coal fire in full and vivid ignition. The heat produced is great, and is thrown into the room by a current of pure air—the products of combustion being altogether carried off into the chimney of the room. A consumption of gas not exceeding 10 or 12 cubic feet per hour, is sufficient to warm a moderate-sized room in a most satisfactory manner; and many small culinary operations may be carried on at the same time without increased expense. Messrs. Smith and Phillips are also the inventors of a great variety of useful apparatus for the employment of gas as fuel in cooking, and in many manufacturing operations.

Communicated Articles.

REPORT OF EXPERIMENTS ON WHITE'S HYDRO-CARBON GAS.

By Thomas G. Barlow, C.E.

The experiments of which the details are recorded in this Report were carried on, during five successive days, in an apparatus erected for lighting an extensive silk mill, in the neighbourhood of Manchester. Steam, for the production of water gas, was supplied from the factory boiler to four cylindrical retorts, 9 inches diameter, ¾ inch thick, and 6 feet long, having horizontal diaphragms, and weighing a little more than 5 cwt. each. The cannel retort was of the usual D form used by the Hydro-Carbon Gas Company, 12 inches wide by 18 inches high, and 6 feet long, also with a horizontal diaphragm. Its weight was about 18½ cwt. The span of the arch within which the retorts were set was 5 feet 2 inches between the piers, and its depth 7 feet. The construction of the furnace was radically vicious, producing a large unnecessary expenditure of fuel, and great irregularity in the heating of the retorts; its width was 12 inches, and its depth 2 feet 6 inches, with six furnace bars.

The condensing apparatus consisted of twenty 4-inch pipes, 9 feet long, connected together by a drain-box at the bottom, and by bends at the top, in the usual manner.

The purifying apparatus comprised a badly constructed wet-lime purifier, 4 feet diameter, with a dry-lime one of the same diameter, having a vertical division by which it was divided into two equal compartments—each compartment being provided with seven trays of pierced iron sieves, the holes in which were so small and distant from each other as to allow of the lime being only partially exposed to the action of the impurities contained in the gas.

The meter was an ordinary mill meter, of the manufacture of Messrs. West and Gregson, of the dimensions usually sold for the passage of 500 feet of gas per hour, but capable of passing from 700 to 800 feet at a moderate pressure.

The cubical contents of the gasholder were 5892 feet. It was guided and counterbalanced so as to reduce the pressure to a column of water 2¼ inches high. The water in the tank was raised so high by a clay embankment, as nearly to immerse the crown of the gasholder, and thus expel its gaseous contents.

The gas was transmitted from the top of the gasholder to an experimental room by tubing half an inch in diameter, which, though it had the advantage of conveying a genuine sample of the gas in a short space of time, had the disadvantage, in consequence of its great length and small diameter, of limiting the maximum consumption of a burner to 5·2 feet of gas per hour. This circumstance prevented me carrying out my intention of burning hydro-carbon gas in quantities increasing in the ratio of the dilution which the original cannel gas was subjected to—a system which, I think, ought to be uniformly adopted in ascertaining the gain or loss of the hydro-carbon process.

The course of experiments I proposed to myself to carry out were—

1. Twenty-four hours' manufacture of unpurified water gas, made with charcoal.
2. The same, with gas made from ordinary Newcastle coke.
3. Twenty-four hours' manufacture of lime-purified hydro-carbon gas from Boghead cannel and charcoal.
4. Twenty-four hours' manufacture of lime-purified hydro-carbon gas from Newcastle cannel and its own coke.
5. The same, purified by oxide of iron instead of lime.

The quantities of charcoal, coke, and fuel, used, could only be ascertained at the termination of the five days' operations, and are, consequently, not noted in the detailed report of the experiments. The temperature of the retorts at the commencement of the operations rather exceeded what is termed "a bright red"—a temperature, in fact, such as would have been suited to the distillation of a coal containing from 30 to 35 per cent. of volatile matter. The whole of the retorts, including the cannel retort, were charged with charcoal about an hour before the steam was introduced—the lids during that period being loosely put on, so as to allow of the admission of a little atmospheric air, to promote the ignition of the charcoal. The following table indicates the quantity produced at successive periods during the

First Day.

Crude Water Gas from Charcoal.

h.	m.	h.	m.	Gas made. cu. ft.	cu. ft.	
	5		....			Lost in commencing operations.
		10	....	145		
		30	....	381		
		15	....	188		
		15	....	156		
		15	....	161		
		15	....	163		
		15	....	154		
		15	....	152		
		15	....	149		
		15	....	153		
		15	....	145		
		15	....	146		
		15	....	141		
		15	....	128		
		15	....	140		The per centage composition of the gas at this stage was—
		15	....	136		
		15	....	128		Carbonic acid ..... 16·50
		15	....	141	..	Carbonic oxide ..... 25·75
		15	....	126		Hydrogen ..... 58·75
		15	....	130		100·00
		15	....	134		
		25	....	129		
5	40	—		—	3426	
15	15				5566	
		1	0	260		
		30	....	80		
1	30	—		—	340	
22	30				9332	

The temperature of the furnace having fallen considerably during the latter period of the experiment, it was suspended for an hour and a half, to give the retorts an opportunity of recovering their heat. It will be remarked that, though the production of crude water gas was at the rate of 605 feet per hour during the first 5 hours and 40 minutes, it fell off to 352 feet per hour for the next 16¼ hours. This was in some measure due to the bad quality of the coal employed as fuel, and also to the charcoal having been rammed up only once during the 22½ hours, instead of at more frequent intervals, as was subsequently practised when charcoal was used.

The per centage composition of the total quantity of gas made during the first day's experiment was—

Carbonic acid	20·00
Carbonic oxide	20·00
Hydrogen	60·00
	100·00

Had the carbonic acid been absorbed by purification, there would have remained as the result of the day's operations—

Hydrogen.....	5600
Carbonic oxide	1866
	7466 feet of purified

water gas, generated at the average rate of about 331 feet per working hour.

Second Day.

Crude Water Gas from Newcastle Pelaw Main Coke.

h.	m.	h.	m.	Gas made. cu. ft.	cu. ft.	
		30	....	213		
		30	....	179		
		30	....	190		
		30	....	196		
		30	....	180		
		30	....	8		Stopped to repair a leak at mouthpiece.
		30	....	239		
		30	....	210		
4	0	—		—	1415	
1	30		....			Stopped to ram up.
15	30				4509	

h. m.	h. m.	Gas made. cu. ft.	cu. ft.	
	30	139		
	30	135		
1 0	——	——	174	
22 0			6188	

The temperature of the retorts had again fallen considerably, and it was also evident that the coke was less efficient than charcoal in decomposing the water—the yield of crude gas being only at the rate of 281 cubic feet per working hour. Its composition, so far as carbonic acid, carbonic oxide, and hydrogen, are concerned, was precisely the same as obtained during the first day; but sulphuretted hydrogen was present in the gas made during the second day, especially after the retorts had been fresh charged, an observation at one period giving as much as 3 per cent. of that impurity. Of purified water gas this day's operations yielded

Hydrogen.....	3713 feet.
Carbonic oxide	1238 „
	4951 „

or 225 cubic feet per working hour.

The first charge of hydro-carbon gas made on the succeeding day served to dilute the small quantity of water gas remaining from the second day's operations in the crown of the gasholder; it was blown off before the second charge was put in.

Third Day.

Hydro-Carbon Gas, from 56 lb. charges of Boghead Cannel and Charcoal.—Gas purified by Lime.

h. m.	h. m.	Gas made. cu. ft.	cu. ft.		
				No. 1.	
12	....			Charged 56 lb. Boghead.	
	11	116			
	7½....	100			
	9½....	100			
	11½....	100			
	14½....	100			
	18	100			
	19½....	100			
	33½....	94			
2 5	——	——	810	Contained 1·5 per ct. of carbonic acid.	
1 17	....			Stopped to get up heats, and charge 56 lb. Boghead.	
				No. 2.	
	8	103			
	9	100			
	10	100			
	11	100			
	13	100			
	16	100			
	19	100			
	22	100			
1 48	——	——	803		
				No. 3.	
20	....			Charged 56 lb. Boghead.	
	9	89			
	10	100			
	11	100			
	11½....	100			
	13½....	100			
	15½....	100			
	18	100			
	22	100			
1 50½	——	——	789		
				No. 4.	
21	....			Charged 56 lb. Boghead.	
	9	96			
	10	100			
	11	100			
	12	100			
	14	100			
	16	100			
	20½....	100			
	6½....	25			
1 39	——	——	721		
				No. 5.	
5	....			Charged 56 lb. Boghead.	
	8	75			
	11	100			
	11	100			
	13	100			
	16	100			
	19	100			
1 18	——	——	575		
				No. 6.	
5	....			Charged 56 lb. Boghead.	
	12	100			
	14½....	100			
	14½....	100			
	17	100			
	20	100			
	24½....	100			
	14½....	50			
1 57½	——	——	650		
				No. 7.	
31	....			Charged 56 lb. Boghead.	
	6½....	46			
	12½....	100			
	15	100			
	20	100			
	26	100			
	29½....	100			
	19½....	55			
2 9	——	——	601		
				No. 8.	
13	....			Charged 56 lb. Boghead.	
	6	45			
	16½....	100			
	17½....	100			
	19	100			
	20½....	100			
	30	100			
	5½....	7			
1 55	——	——	552		
				No. 9.	
16	....			Charged 56 lb. Boghead.	
	12	93			
	14	100			
	16	100			
	20	100			
	22	100			
	27	100			
	5	20			
1 56	——	——	613		
19 58			6114		

The work done by the water-gas-generating retorts may be estimated, by deducting from the total quantity of gas made that portion which is known to be due to the Boghead, on the basis of 12,800 feet per ton. The following table exhibits the produce of each charge estimated in this manner:—

	Total Gas made.	Boghead Gas.	Partially Purified Water Gas.	Purified Water Gas.
Charge No. 1 ..	810 ..	320 ..	490 ..	
„ 2 ..	803 ..	320 ..	483 ..	
„ 3 ..	789 ..	320 ..	469 ..	
„ 4 ..	721 ..	320 ..	401 ..	
„ 5 ..	575 ..	320 ..	255 ..	
„ 6 ..	650 ..	320 ..	330 ..	
„ 7 ..	601 ..	320 ..	281 ..	
„ 8 ..	552 ..	320 ..	232 ..	
„ 9 ..	613 ..	320 ..	293 ..	
	6114	2880	3234	2807

Proportion of cannel gas to purified water gas .. 100 : 97.

The average yield of purified water gas is thus found to be reduced to 140 cubic feet per working hour.

The whole of the 5304 feet of gas produced by Charges No. 2 to 9 in 16 hours 24 minutes, from 4 cwt. of Boghead, were collected in the gasholder, and the value carefully determined, after standing for upwards of 4 hours. It contained 14 per cent. of hydro-carbons, condensable by bromine, and 7 per cent. of carbonic acid, which had escaped purification by lime. It yielded no trace of sulphuretted hydrogen or ammonia with the ordinary tests for those impurities.

The mean of 19 carefully conducted observations upon its illuminating power, when consumed in a large-sized fishtail burner at the rate of 5 feet per hour, gave 17·3 standard spermaceti candles (120 grains). The luminiferous matter in a ton of Boghead cannel thus treated was consequently equivalent to 1573 lb. of sperm; and, as my own experience of the value of this singular material when treated by the usual process gives 2057 lb. of sperm, with a consumption of 1·5 foot per hour, it follows that there would have been a loss of illuminating matter to the extent of 24 per cent., if the gas had been sent out for consumption in the state in which it was delivered into the gasholder, the actual composition of the contents of which must have been—

Boghead cannel gas		2560 feet.
Water gas, viz.:—		
Carbonic acid.....	371 feet.	
Carbonic oxide and hydrogen	2373 „	
	——	2744 „
		5304 „

= to 26,520 feet per ton of cannel.

The large loss in illuminating matter induced me to institute further researches with a view of ascertaining how much of it was due to the carbonic acid which had passed through the purifiers

without being arrested by the lime. I accordingly caused the gas, on its passage from the gasholder to the burner, to traverse a small purifier containing about 100 cubic inches of lime. The effect of this was to reduce the per centage of carbonic acid from 7 to ¾, and to increase the illuminating power from 17·3 to 35· candles. Unfortunately, the resistance of the purifier so reduced the supply of gas at that burner as to render it impossible to consume it in a larger quantity than 3·268 feet per hour. The fact was, however, satisfactorily proved that the taking out of 6¼ per cent. of carbonic acid immediately doubled the illuminating power, or, more properly speaking, the presence of this quantity of that impurity diminished the luminiferous value of the gas to the extent of 50 per cent.; and here will, I believe, be found the solution of the various discordant statements which conscientious and careful scientific men have put forth on the subject of the hydro-carbon process.

Deducting the 6¼ per cent. of carbonic acid from the total quantity of gas produced, and estimating the residue at 35 candles for the 5-feet fishtail burner, the luminiferous matter from a ton of cannel is raised to 2842 lb. of sperm, or a gain of 38 per cent. over the ordinary process of manufacturing; and had it been practicable to burn the gas at the rate of 5 feet per hour, and taken out the remaining ¾ per cent. of carbonic acid, I have no doubt the gain would have been upwards of 50 per cent., and would probably have been more had the proportion of water gas been increased.

The gasholder was at this stage emptied of its contents, and the purifier recharged with lime for the next day's operations.

Fourth Day.

Hydro-Carbon Gas, from Charges of from 84 lb. to 112 lb. of Newcastle Cannel and Charcoal.—Gas purified by Lime.

h.	m.	h.	m.	Gas made. cu. ft.	cu. ft.	
						No. 1. Charged 84 lb. Newcastle cannel.
			5¼	101		
			4¾	100		
			4¾	100		
			5¼	100		
			6¼	100		
			6¾	100		
			7¼	100		
			7½	100		
			8	100		
			8	100		
			9	100		
			11¼	100		
			14	100		
			21	110		
2	0	——		——	1411	
						No. 2. Charged 98 lb. Newcastle cannel.
	28		....			
			4½	90		
			5¼	100		
			5¾	100		
			6¼	100		
			6¼	100		
			7	100		
			7¾	100		
			7	100		
			7¼	100		
			7	100		
			7¾	100		
			8¾	100		
			9	100		
			9	100		
			13	100		
			8	57		
2	0	——		——	1547	
						No. 3. Charged 112 lb. Newcastle cannel.
	13		....			
			3	43		
			14	200		
			15	200		
			24	300		
			17	200		
			26	300		
			36	300		
			20	150		
2	35	——		——	1693	
						No. 4. Charged 112 lb. Newcastle cannel.
	56		....			
			2	50		
			7	100		
			7¼	100		
			8¼	100		
			9½	100		
			9	100		
			9½	100		
			21	200		
			22	200		
			24	200		
			20	226		
2	30	——		——	1476	
						No. 5. Charged 112 lb. Newcastle cannel.
	10		....			
			6	74		
			10	100		
			11	100		
		1	32½	680		
			30	195		
2	30	——		——	1189	
						No. 6. Charged 112 lb. Newcastle cannel.
	32		....			
			8	80		
			12	100		
			13	100		
			13½	100		
			14	100		
			15½	100		
			32	200		
			16	100		
			19	100		
			7	42		
2	30	——		——	1022	
						No. 7. Charged 112 lb. Newcastle cannel.
	45		....			
			4½	58		
			9	100		
			9½	100		
			10½	100		
			11	100		
			11½	100		
			12	100		
			12	100		
			12	100		
			13	100		
			13	100		
			13	100		
			14	100		
			9	70		
2	34	——		——	1328	
19	43				9666	

Following the plan adopted in the previous day's operations, of estimating the duty done by the water-generating retorts, I find they have aided in the production of hydro-carbon Newcastle cannel gas in the following proportions, the yield of gas from the cannel being estimated at 8500 feet per ton :—

	Total Gas made.	Newcastle Cannel Gas.	Partially purified Water Gas.	Purified Water Gas.
Charge No. 1	1411	318	1093	
„ 2	1547	371	1176	
„ 3	1693	425	1268	
„ 4	1476	425	1051	
„ 5	1189	425	764	
„ 6	1022	425	597	
„ 7	1328	425	903	
	9666	2814	6842	5779

Proportion of cannel gas to purified water gas 100 : 205.

The average yield of purified water gas per working hour (19¾) here rose to 292 feet, a considerable portion of which increase is probably due to the retorts having recovered their heat, while the value of the gas made during the previous day was being determined, the admission of steam having been suspended for 7½ hours for that purpose.

The gas contained 4·25 per cent. of hydro-carbons condensable by bromine, and 11 per cent. of carbonic acid, without any traces of sulphuretted hydrogen or ammonia.

The mean of 19 observations upon its illuminating power, when consumed in a large fishtail burner at the rate of 5 feet per hour, was 1·86 standard sperm candles; and, as the yield was at the rate of 29,180 feet of gas per ton of cannel, the luminiferous matter was equivalent to 186 lb. of sperm. My own experience of the value of Newcastle cannel, when treated by the usual process, gives 851 lb. of sperm per ton of cannel, upon a consumpt of 2·37 feet per hour; there would therefore have been a loss of illuminating matter to the extent of nearly 78 per cent., had the gas been consumed in the state in which it entered the gasholder, composed as it must have been of

Newcastle cannel gas		2814 feet.
Water gases, viz. :—		
Carbonic acid	1063 feet.	
Carbonic oxide and hydrogen ..	5779 „	
	——	6842 feet.
		9666

On being subjected to the action of lime in the small purifier

used on the previous day, 10 out of the 11 per cent. of the carbonic acid present in the gas was absorbed, and the illuminating power of the residue rose from 1·86 to 12·5 standard candles for the 5-feet fishtail burner—a quality superior to the gas in common use in the metropolis. Deducting the 10 per cent. of carbonic acid, the yield of purified hydro-carbon gas was at the rate of 26,262 feet of gas per ton, of the value of 1125 lb. of sperm, being a gain of 32 per cent. in illuminating matter; and, had it been practicable to take out the remaining portion of carbonic acid, the gain would, in all probability, have been 40 per cent.

With the view of testing the accuracy of the theory entertained in some quarters as to a portion of the carbonic acid being converted into carbonic oxide in its passage through the cannel retort, I caused the lime to be taken out of both purifiers, and the dry one to be filled with a preparation of oxide of iron, which had already been used for purifying gas from sulphuretted hydrogen at one of the large London gas works. The whole of the carbonic acid would be thereby retained in the gas, and the total quantity produced could be determined.

Fifth Day.

Hydro-Carbon Gas from 112 lb. Charges of Newcastle Cannel, and its own Coke.—Gas purified by Oxide of Iron.

h. m.	h. m.	Gas made. cu. ft.	cu. ft.	
				No. 1. Charged 112 lb. Newcastle cannel.
	11½	....	26	
	16½	....	100	
	1 6½	....	700	
	11½	....	100	
	14½	....	100	
	14½	....	100	
	15½	....	100	
	15½	....	100	
2 34	——	——	1326	
				No. 2. Charged 112 lb. Newcastle cannel.
12½	....			
	10½	....	94	
	8½	....	100	
	9¾	....	100	
	10¾	....	100	
	11	....	100	
	12	....	100	
	12½	....	100	
	13½	....	100	
	13	....	100	
	14½	....	100	
	20	....	135	
2 30	——	——	1329	
				No. 3. Charged 112 lb. Newcastle cannel.
37	....			
	6	....	65	
	9	....	100	
	10½	....	100	
	11½	....	100	
	13	....	100	
	13	....	100	
1 27	....		464	
2 30	——	——	1029	
				No. 4. Charged 112 lb. Newcastle cannel.
30	....			
2 30	....		1006	
				No. 5. Waiting for a supply of cannel. Charged 112 lb. Newcastle cannel.
4 3	....			
	3	....	40	
	8	....	100	
	9½	....	100	
	10	....	100	
	11½	....	100	
	12	....	100	
	12½	....	100	
	12½	....	100	
	14½	....	100	
	17½	....	100	
	22	....	100	
	18	....	116	
2 30	——	——	1156	
17 56½			5846	

Hydro-carbons condensable by bromine	5·5 per cent.
Carbonic acid	12·5 „
Illuminating power of a 5-ft. fishtail burner..	2·28 candles.
Gas per ton of cannel	23,384 feet.
Value of illuminating matter	182 lb. sperm.
Loss in illuminating matter	79 per cent.
The same Gas when purified from Carbonic Acid.	
Illuminating power of a 5-ft. fishtail burner..	13·28 candles.
Gas per ton of cannel	20,459 feet.
Value of illuminating matter	931 lb. sperm.
Gain in illuminating matter	9½ per cent.

	Total Gas made.	Newcastle Cannel Gas.	Crude Water Gas.	Purified Water Gas.
Charge No. 1	1326	425	901	
„ 2	1329	425	904	
„ 3	1029	425	604	
„ 4	1006	425	581	
„ 5	1156	425	731	
	5846	2125	2721	1991

Proportion of cannel gas to purified water gas.. 100 : 94.

Deducting from the total time the 4 hours 3 minutes lost in waiting for a supply of cannel, the yield of purified water gas was 143 feet per working hour. The effect of the 4 hours' suspension of the experiment in increasing the temperature of the retorts is apparent in the excess of water gas produced during the 5th charge over the 4th.

The carbonic acid generated by this day's operations was 730 cubic feet, or 26¾ per cent. of the total volume of crude water gas. What portion of this was given off by the cannel, and what portion was generated in the water-gas retorts, it is impossible to determine; but, as the first and second days' experiments gave a crude water gas containing only 20 per cent. of carbonic acid, and on the fifth day's, by the hydro-carbon process, this impurity was increased to 26¾ per cent., I think it is reasonable to infer that no portion of it was converted into carbonic oxide in its passage through the cannel retort. A large portion of the excess is undoubtedly produced from the cannel employed; but this will not be sufficient to account for the whole: some portion of it is probably due to the cooling of the water retorts, and the consequent increase in the per centage of carbonic acid in the crude water gas.

The most remarkable feature in the fifth day's experiments is, that the gain of illuminating matter obtained by the hydro-carbon process appears to be considerably less than on the two previous days, the comparative table of results being as follows:—

	Cannel used.	Cannel Gas.	Purified Water Gas.	Gain per Cent. in illuminating Matter.
3rd day....	Boghead.....	100	97	38
4th day....	Newcastle	100	205	32
5th day....	„	.... 100	94	9½

The only difference in the mode of manufacture adopted on the several days was in the purification; this operation being effected on the third and fourth day by lime, and on the fifth by oxide of iron—a material which is supposed to act injuriously on the heavy hydro-carbons contained in coal gas, and this may possibly have been the cause of the great decrease in illuminating matter.

On stock being taken at the termination of the fifth day's trial, I ascertained the total consumption of materials to have been—

Fuel.

	Cwt.	qr.	lb.
Common furnace coal, costing 3s. 6d. per ton ..	55	2	7
Newcastle cannel coke	3	0	7
	58	2	7
Consumption of fuel per diem	11	2	24

Carbon for decomposing Water:—

Charcoal.....	379 lb.
Coke	229 „
	608 „

Total quantity of crude water gas generated.....	28,317 feet.
Carbon used per 1000 feet of crude water gas	21·4 lb.
Total quantity of purified water gas generated.....	22,994 feet.
Carbon used per 1000 feet of purified water gas....	26·4 lb.

Theoretically, only 16 lb. of dry charcoal should be consumed in the manufacture of 1000 feet of water gas, consisting of equal proportions of carbonic oxide and hydrogen; and the large excess shown in these experiments arises, first, from the whole of the carbon which combined with the oxygen to produce carbonic acid being permanently lost; and, next, from the partial ignition of the carbonaceous material itself, which takes place during the charging of the retorts. Practically, it will, in all probability, require 20 lb. of carbon per 1000 feet of purified water gas where the operation is carried on in a properly constructed apparatus.

The defective construction of the furnace for heating the retorts employed in these experiments caused an enormous waste of fuel, which an improved system of setting would prevent. At some mills in the vicinity of Manchester, where water gas is used for singeing woven cotton fabrics, I am informed the fuel does not exceed 56 lb. of furnace coal per 1000 feet of crude gas generated—exclusive of the fuel required for converting the water into steam. This consumption coincides with other experiments, to the records of which I have had access.

(*To be concluded in the next number.*)

Correspondence.

REMARKS ON DR. LETHEBY'S NINTH REPORT.

Sir,—It is not without a considerable amount of reluctance that I again resume my pen, for the purpose of noticing the singularly

incorrect and evasive report upon the London gas lately presented to the Court of Sewers by Dr. Letheby. I had, indeed, fondly imagined that, as this gentleman must by this time have discovered the full grossness of his vitriolic error, he would have had the candour to admit it, and, profiting by the past, become more cautious in future. I am, however, disappointed; for not only is there no such acknowledgment as the occasion requires, but unhappily a much-to-be-reprobated attempt is manifested throughout the entire report, to gloss over and conceal that error by converting the imaginary "21 grains of oil of vitriol" into a corresponding number of grains of real anhydrous sulphuric acid. I feel almost ashamed to expose this miserable "ruse," lest the public should gather the idea that chemistry is made up of such things; but no good ever did come of concealment, and therefore I will proceed.

It must be in the remembrance of my readers that I took at the commencement no small trouble to distinguish oil of vitriol from sulphuric acid; and I, moreover, pointed out to Dr. Letheby the important fact, "so well known to chemists," that if even only one-half of the sulphuric acid found was in combination with ammonia, then not one particle of oil of vitriol could by possibility exist in the condensed products of the combustion of coal gas; hence I suggested in common fairness the necessity of giving a complete and correct analysis of these products, as is (I will not say usual but) universal with chemists, and without which, in fact, analysis is a mere sham. Well, we find in the report almost all kinds of analyses, more or less perfect, of almost everything but the only thing in dispute, and this is, as it would seem, purposely or conveniently ignored from beginning to end. What there is except anhydrous sulphuric acid in the condensed products of coal-gas flame, no man may thence gather; there are vague assertions, gross errors, and manifold inconsistencies, but an analysis of the only kind which could have proved or disproved Dr. Letheby's 21 grains of oil of vitriol story cannot be had or made out of the whole report. I will not, however, dwell longer upon this subject, but proceed to follow the arrangement of the report in its treatment of the coal-gas question; merely premising that, for the honour of science, I would willingly have commenced at this point sooner.

The first object of attraction is a photometrical table, which, with one exception, looks so uncommonly like those I have been in the habit of publishing in the pages of the JOURNAL OF GAS LIGHTING, that I heartily congratulate Dr. Letheby on his near approach to the truth: instead of finding the Central gas at 22 candles and the City at 9 or 10, he now finds the City and the Central almost exactly what I have represented them to be for many months past. But he must try the City cannel gas again more carefully; it is in reality 26-candle gas, and has given me, time after time, from 12·5 to 13·5 candles for the 2½ cubic feet of hourly consumption, when burnt in a No. 3 cannel fishtail, and "to this complexion it must come at last."

The next table has reference to the pressures employed by the different companies; and it strikes me that here Dr. Letheby has got desperately out of his latitude, though I do not pretend to understand gas engineering. The highest and lowest pressures of the different companies are given thus in the report:—

	Highest.	Lowest.	Difference.
City Company	2·2	1·5	0·7
Great Central	1·8	1·0	0·8
Chartered, Brick-lane ..	1·2	0·6	0·6
,, Curtain-road ..	1·0	0·4	0·6

whilst Dr. Letheby concludes with the following strange remark:—"From this it will be seen that the Chartered Company not only furnishes gas at a rather low pressure, but the variation between the extremes is *so great* that the public must suffer inconvenience from it." Now, when I was at school my master used always to impress upon my mind that a difference or variation of 8 was greater than a difference or variation of 6; but then he was not a "toxicologist."

We have next a table of the relative proportions of ammonia contained in the various gases, though this is of not the least possible use towards the vitriolic hypothesis which it is subsequently brought to support. The ammonia resulting from the combustion of coal gas is not altogether contained in the gas as ammonia, but results in part from the presence and subsequent destruction of certain nitrogenous or basic compounds contained in the gas, and necessary to its illuminating quality. These, in burning, form ammonia, and ultimately generate sulphate of ammonia, exactly as sulphate of ammonia is formed and deposited in the soot of our chimneys, the value of which, as a fertilising agent, is well known to farmers; in fact, in my younger days sulphate of ammonia used to be made from soot. The ammonia, then, need no more exist in the gas as ammonia than in the coal; it is enough if the elementary constitution be present; and Dr. Letheby can know very little about coal gas, if he is ignorant of the existence in it of several basic compounds, such as I have mentioned.

We now arrive at the Tar part of the report—a portion which I am sure will long excite the amazement and ridicule of the scientific world. In a previous report Dr. Letheby had thrown out a fearful hint that the chariot wheels of plague and pestilence were lubricated with gas tar; that, in short, through it we were all on the high road to "dusky death." As a medical man, I took the liberty of showing that gas tar was a very different commodity: that it possessed powerfully antiseptic properties, and was therefore, in all human probability, a plague destroyer, and not a man-killer. The truth of this could not be gainsaid, and therefore Dr. Letheby now asserts, or wishes to assert, that antiseptics are poisons, and that tar is highly injurious to health. Now, if Dr. Letheby had any claim to be regarded as a medical man, or if he possessed a degree or diploma from any of our medical or surgical colleges, or if, in fact, he was a doctor in any other respect that by "courtesy," I should feel justified in expressing my extreme astonishment at his preposterous ignorance; but as the case stands, I will merely signify my surprise at his presumption in venturing to deal with matters so foreign to his province, and so far beyond his powers. The antiseptic and poisonous properties of substances have no more to do with each other than their colour or shape has to do with their specific gravity. If I were compelled to dogmatise upon such a subject, I would say just the reverse of Dr. Letheby's absurd assumption is the correct one—the most powerful antiseptics are not poisons. Take common salt for example, a very powerful antiseptic, and one in almost universal use: is common salt a poison? Take sugar, with which in Yorkshire and elsewhere hams are generally cured: is sugar a poison? Take charcoal, a well-known antiseptic: is charcoal a poison? Take brandy: is brandy a poison? or the essential oils of cloves, mace, nutmegs, &c.: are these poisons? If so, I fear we must be content to console ourselves with the immortal Tom Hood, by reflecting,

> "If wine 's a poison, so is tea,
> Though in another shape;
> What matter whether one is killed
> By 'canister' or 'grape.'"

In fact, we ought, it seems, no longer to regard the metropolis as a place to live in, but merely to die in; and, consistently with the principles he inculcates, Dr. Letheby should have placed a "*caput mortuum*" by way of frontispiece to his report, with the concluding remark of Job's disastrous messengers at the end, "And I alone am left alive to tell thee."

But it will be said that there are antiseptics which are poisons, and that coal tar may be of this class. Well, let us inquire then how far this is correct. Of course I omit all notice of Dr. Letheby's idiosyncratic illness from the smell of gas tar. Some people are made sick by the smell of musk, and I myself have a decided aversion to the odour of tobacco—in short, as Shylock says,

> "Some men there are, love not a gaping pig,
> Some that are mad if they behold a cat,"

and so forth, proving clearly enough that I may pass on to a consideration of the therapeutic or other qualities of coal tar, without reference to Dr. Letheby's special experience or the cases he quotes of the "strongest individuals." Indeed, so far as I have seen, the "strong individuals" engaged in repairing our street mains are generally attacked by an illness of a thirsty kind, for which a "pot of beer" is held to be a specific remedy; and I have further noticed that those engaged in making hay and other agricultural pursuits are liable to the same disease, and require the same mode of treatment; consequently, I infer that gas tar has nothing to do with it.

There was an opinion at one time that some essential difference existed between what was called vegetable and mineral tar; but the practical experience of Mr. Young has settled this question, and proved that coal tar and wood tar consist of the same substances, and are, in all senses of the word, identical. Such being the case, let us examine how far the asserted poisonous or baneful influence of tar has tended to injure the health of those most exposed to its effects. From time immemorial the antiseptic qualities of all kinds of tar have been had recourse to, as a means of preserving the wood and cordage of ships, and not only have our sailors been compelled to breathe an air loaded with tarry exhalations, but their hands, faces, clothes, nay, their very victuals, have been contaminated with it. Do they, then, as a body of men, look like poisoned individuals, or is the navy regarded as more unhealthy than the army? Curiously enough, too, the men who work at the tar tanks in gas works obtain a very respectable age, and suffer less from disease than an equal number of agricultural labourers. A Mr. Holliday, well known as the inventor of an extremely useful naphtha lamp, is in the habit of distilling hundreds of gallons of coal tar, but he knows nothing about the illness described by Dr. Letheby. Again, a Mr. Bethel distils his thousands of gallons, and worse than this—if worse can be—he impregnates millions of railway sleepers with the "venomous distillation," and these are laid down all over the country at a depth not one-fourth of that commonly assigned for gas pipes—yet Mr. Bethel has no alexipharmic, nor are his workmen spectres. Then there are the different asphalte pavement companies, who certainly do at times originate an odour in our streets not exactly "like the sweet south breathing over a bed of violets." Of course they poison thousands, and, so to say, "pave the way" for the undertaker. I wonder why the Board of Health allowed them to lay down their fatal pavement close to Gwydyr-house? As regards smoked hams, &c., cured with creasote, I need not say much, when it is known that this substance, the very quintessence of tar, is frequently introduced into the mouth as a remedy for toothache, without, that I am aware of, poisoning

anybody. I know not whether by this time I have made Dr. Letheby blush at his monstrous "mare's nest," but I am quite sure that I have said enough to satisfy the public mind respecting the innocuous nature of gas tar: the first is a matter of great indifference to me; the last, on the contrary, is the chief object of my present labour, and did I suppose that any stronger proofs were required, I would immediately furnish them.

I have all along had a strong suspicion that Dr. Letheby did not know how to determine the total amount of bisulphuret of carbon existing in coal gas, and his last report demonstrates the correctness of my suspicion—he is, indeed, altogether very ignorant upon the subject of gas. Thus, the *utmost* amount of anhydrous sulphuric acid which he has ever been able to obtain has not reached higher than 212 grains from 1000 cubic feet, whereas the *smallest* I am in the habit of procuring from the same bulk of gas is nearly 400 grains. But, if he will follow the proper course, he will discover that all his conclusions are worthless on this head. To ascertain the quantity of bisulphuret of carbon contained in coal gas, the gas must be burnt in any convenient manner, so that a decided excess of ammoniacal vapour may mingle with the flame during the whole period of combustion. The products arising from the flame are to be completely condensed, as far as possible, by cold; and the fluid thus obtained, after being boiled for a short time, to expel the excess of ammonia which it contains, must be mixed with the washings of the condensing apparatus, and treated with a little chlorine water, then evaporated to one-fourth of its bulk, and slightly acidulated with muriatic acid; a solution of muriate of baryta is next to be poured in, and the usual precautions taken for collecting, washing, and drying the precipitate, the weight of which from any given bulk of the Great Central gas will, I am sure, vastly astonish Dr. Letheby. On an average of the last fortnight it has been at the rate of nearly two grains from each cubic foot, and would very likely have been three if the usual winter's make of gas was passing the purifiers. There is also another fact which Dr. Letheby may notice at the same time, which is, that if the ammonia be taken out of the gas by sawdust saturated with a dilute acid, and no ammonia be applied to the burner, then little or no sulphuric acid can be obtained, thus affording a striking illustration of the truth of my observation that the ammonia arrests the sulphurous acid, and forms sulphate of ammonia on combining with the condensed water, and, were there no nitrogenised bases in the gas, not even a trace of sulphuric acid would be found. I am, therefore, surprised to see that Dr. Letheby has gradually diminished his amount of sulphuric acid: it began, like the illuminating power of the Great Central gas, at somewhere about 21, but has now fallen even in the worst case to 13·9, "part of which is combined with ammonia."

We are next told that "ammonia is so unstable a compound, that it cannot resist the decomposing power of the burning gas"; but, unfortunately, most people have noticed upon the bell-glasses sometimes suspended over burners, and also upon the upper third of the glass chimneys used for argand burners, a white dusty-looking powder, which powder is neither more nor less than sulphate of ammonia, as any person with a slight knowledge of chemistry may very easily determine. When acted on by slacked lime, slightly moistened, it evolves ammonia; and when dissolved in distilled water it precipitates muriate of baryta.

Dr. Letheby has searched from the Land's End to John o'Groat's, and discovered some five or six instances in which the books in libraries have been supposed to be damaged by the combustion of gas; but how happens it that these cases are not as plentiful as "blackberries"? Wherever gas is burnt, rotten books should be found upon that simplest of consequences, "*ubi mel ibi apes.*" If I were to give Dr. Letheby all he asks for in this respect, I should still have on my side of the question all the other libraries in the kingdom in which gas is burnt and the books are not rotten. He would have the exception, and I the general rule. The thing is scarcely worth pursuing further, were it not as an example of the difficulty which besets a man in a bad cause. Dr. Letheby tells us that he exhibits two bottles containing oil of vitriol made from coal gas—one bottle being filled with that made by means of "a platinum rosette," the other from the gas "burnt *exactly* as the public consume it"; which latter, we are subsequently informed, "is at the rate of half a cubic foot an hour from a Leslie's burner." (!) Now, apart from the Herr Doebler nature of this bottle trick, in respect to which the truth must still rest upon Dr. Letheby's bare word, as the commissioners could not otherwise know whether the said bottles had not been filled at the nearest druggists, apart, I say, from this, who ever thought of burning half a foot of gas per hour in a Leslie's burner, and then asserting that this is "exactly as the public consume it"? And yet this passed down the throat of the Court of Sewers! May it never be suffocated!!

Next we have some sulphate of copper from the Athenæum Club, which entirely corroborates the view I have all along held on this matter, as illustrated by my employment of ammonia in the analysis of coal gas previously described. Any basic oxide will, of course, answer equally, or at least nearly, as well as ammonia; and the oxides of copper and zinc, which form in the inside of a ventilating tube, will first arrest the sulphurous acid, to form, like ammonia, a sulphite, which, on exposure to the air, becomes a sulphate; but, meanwhile, there is no oil of vitriol here. And again, Dr. Letheby is grievously wrong in his chemistry when he asserts that "the acid must have been in a free or corrosive state, or it would not have attacked the metal"—the fact being that all the soluble salts of ammonia attack copper, although they contain no free acid, and the sulphate and muriate of ammonia rapidly corrode iron, as is well known to most people.

Dr. Letheby has called in the names of Faraday, Brande, Prout, and Aiken, to his assistance; but it is very little likely that any one of these gentlemen would have suffered the wholesale manufacture of oil of vitriol which he describes to go on to the injury of the public without interposing their authority or warning the nation generally. In a matter of much less apparent moment, though, I believe, not more baseless, I mean "table-turning," Dr. Faraday stepped out of his way to put it down; and, on examining the evidence which he gave to the committee upon the Athenæum case, he is reported by Mr. Brande to have said, in reply to questions from the committee—

Query.—Is either sulphurous or sulphuric acid formed by the combustion of coal gas?

Answer.—A little sulphurous or sulphuric acid is generally formed from the combustion of coal gas. If well purified gas be used, the product is rarely sensible; it is less sensible as sulphuric than as sulphurous acid.

Query.—Will an oil or gas light soonest soil the ceiling of a room?

Answer.—Neither oil nor gas ought to soil, or will soil, the ceiling of a room, if well regulated. Either will do so if badly regulated. Of the two, oil is most liable to do so. As to the sulphurous acid and unburnt gas, I think little of it.

This looks like anything but the answer of a man who knew that many hundredweights of oil of vitriol were annually poured upon the devoted heads of himself and fellow-citizens. No, Dr. Letheby must keep the whole merit of that discovery to himself. Dr. Faraday has no right to a drop of it—it is all his own—all the oil of vitriol.

It seems to me that Dr. Christison has been brought from his university for a very trifling object, if all he can tell us is that "flowers wither in the rooms in Edinburgh." I never had the least doubt of it, whether there be gas in the rooms or not. But does the withering of a bouquet imply the presence of oil of vitriol? I guess not. However, I am glad to see Dr. Christison, for I wish to give him a hint. In his lectures, I believe, he is in the habit of recommending his pupils, in case of poisoning by oxalic acid, where chalk cannot readily be had, to scrape the walls and ceiling of the room, and administer the powder thus obtained in water rather than do nothing. But this could only be useful where the powder in question consisted of carbonate of lime. If, however, gas had been burnt in the room, and Dr. Letheby be correct, then woe for the sufferer, for the walls and ceiling would, in that case, be a solid selenitic formation of sulphate of lime, of no use to the patient. At the same time, my own experience, as regards the ceiling of rooms long lighted with gas, has not enabled me to discover any of the gypsum thus hourly generated. All the scrapings I have got, dissolved in diluted muriatic acid with a very brisk and lively effervescence. Gentle reader, try your own!

Need I say anything more about the rotten books? A mere word or two. Well, the leather, it seems, was so dry and rotten, that, according to Mr. Brayley, it was reduced to a "brittle substance, composed of a scarcely coherent powder, which had a powerful acid taste." Those who know anything about oil of vitriol, know that, when mixed with leather, it forms a pulpy and semifluid mass, and not a brittle scarcely coherent powder; and when to this I add that the paste used by bookbinders, in fixing the leather on to the books, is largely mixed with alum to prevent it from moulding, the "powerful acid taste" can require no explanation.

But I have been told, on the very best authority, that the United Service Club now affords an example of another kind, for in the library, in which nothing but wax and spermaceti candles are ever burnt, the books have become prematurely rotten, and either require fresh binding, or have actually been rebound. What, then, is the probable origin of the destruction of the leather? In my opinion it is the same as that which would arise in a damp cellar. Gas notoriously generates a large quantity of water, though scarcely one-half as much as is produced by oil, when equal lights are implied. This water, in both cases, would of course rise in the form of vapour; and if the books were kept very cool during the day by the influence, for instance, of a skylight, aided by very thick walls, the moisture would condense upon them in the evening; and this, being frequently repeated, would in time destroy the paste and detach the leather in the very non-coherent or powdery form described by Mr. Brayley, after first putting on the shrivelled and broken appearance seen at the *Times* office, where, by-the-by, it would not surprise me to learn that *everything* was "rotten," for even creasote itself might corrupt in *that* atmosphere. But, in point of fact, the water given off on the combustion of gas or oil is immediately taken up as vapour by the air of our apartments, and, if a moderate degree of ventilation exists, no sensible condensation ensues except under very rare circumstances, for even water itself exposed to the atmosphere is seen to dry up or evaporate in consequence of this aerial affinity for moisture.

In one instance, regarding the bisulphuret of carbon, where, from a misprint of the word "bulk" instead of "weight," Dr. Letheby

fancied I was wrong, he was kind enough to mention my name; but in another case, where he thought proper to adopt my views respecting high and low heats, Dr. Letheby has forgotten to make me the same acknowledgment of priority. I am but little given to remark upon these things, but after the flourish of trumpets with which we were told in the first instance that science had not been applied to for the purification of gas from bisulphuret of carbon, we had, I think, a right to look for something better than an old published idea of my own, and the antiquated expedient of burning gas on the outside of our houses instead of in them. That some attention has been paid to purification from bisulphuret of carbon, I can myself bear witness, for I was employed three or four years ago by George Ramsay, Esq., of Newcastle-on-Tyne, and Mr. Wright, of the Western Gas Company, to make an extensive series of experiments with that very view; and I did make upwards of 3000 experiments upon more than 1400 different salts and metallic oxides, from the sulphuret of sodium and the permanganate of potash, to the oxides of platinum, gold, and palladium, but, for one reason or other, all were practical failures. I also know that Mr. F. I. Evans of Westminster, Mr. Laming of Millwall, Mr. Wright of Kensalgreen, and, I believe, Mr. Hills of Deptford, have been long and most assiduously engaged upon the same subject. "No notice," indeed! but this is of a piece with the usual style of assertion. If ever a means is discovered by which, without injury to the gas, bisulphuret of carbon can be completely removed from it, this will not be, I am sure, the result of chemical reasoning, but of some instinctive accident.

But the idea of burning gas "outside the room or shop" requires a little elucidation to fit it for the general reader. It is a fact that light diminishes according to the square of the distance, therefore a candle at one foot from the spectator affords him as much light as 100 candles at ten feet: now, from the centre of an ordinary shop to that part of the outside of the window where a burner could be placed is almost, never less, and frequently much more than ten feet; consequently a shopman, who now consumes five cubic feet per hour with one argand burner, would, under the new arrangement, burn 500 cubic feet in 100 burners to obtain the same light he now enjoys; and an establishment whose gas account is now £100 per annum would thus find itself let in to the tune of £10,000 per annum, with no additional increase of light. It is a brilliant idea; but where is the gas to come from, not to mention the money?

I ought not, it seems to me, to conclude this without some observations upon the conduct of the Court of Sewers. Why did that court, seeing the subject to be one upon which a dispute was raised, not employ some neutral person to investigate the civic gas? Of all men, Dr. Letheby and myself were the only two who could not be supposed to enjoy that indifference to the result which was necessary for an honest and truthful inquiry; why, then, was so bad a selection made, when many highly competent men would willingly, and quite as cheaply, have undertaken the task? The truth is easily told. We have lived to realise the parable of Jotham—the "vine, the olive, and the figtree," despise us, therefore we are governed by the "bramble." Instead of merchants, bankers, and intelligent gentlemen, London, the great commercial city of the world, is ruled over by petty shopkeepers, until the very offices which were once objects of emulation and honour, are now used as a means of pecuniary extortion, with a view to bargain away the disgrace of holding them.

The existence of such a state of things is not, however, the whole, or even chief, circumstance to be regretted in this matter. We must look deeper into the face of society, ere the full evil can be detected. A want of proper education lies at the root, and is unhappily not confined to our Courts of Aldermen and Common Council. Take the public at large, and we shall find with what rapid avidity any preposterous exaggeration will be received, compared with the dull attention accorded to the small still voice of homely truth. The first will pass as easily as a sprat through the jaws of a whale; the last like "a camel through the eye of a needle." He who will get up some monstrous outcry—strychnine in beer, arsenic in bread, cholera morbus in water, oil of vitriol in gas, or prussic acid in everything—shall soon find himself surrounded by a long-eared crowd. But he who has nothing but the honest truth to tell, will meet with few listeners; as witness the following tale:—An affluent quack doctor was taken ill in the midst of his profitable labours, and immediately sent to a neighbouring physician, who prescribed for and speedily cured him. The acquaintance thus commenced ripened into an intimacy; so that one day, in friendly chat, the physician said to his new patient, "How happens it that you are able to keep up this splendid establishment, and that beautiful carriage, whilst I am scarcely able to purchase the boots I wear away in travelling through the mud and mire of the streets?" "Oh!" said the quack doctor, "I will explain that. Look out from this window at the crowd of people passing along the street. Well! for every wise man in that crowd there are ninety-nine fools. When illness arises, the fools come to me, and the wise man goes to you." The physician sighed, and went off quietly to his humble abode.

LEWIS THOMPSON.

MANN'S PURIFICATION.

SIR,—Mr. Hills, in his letter of the 10th instant, says that any person using the oxide of iron to purify gas without a license would infringe his patent; and, in the same communication, he refers to the mode of using the oxide of iron at these works, which can certainly have nothing to do with his patent, for here the oxide is used to purify foul lime, and not gas. W. H. MANN.

City of London Gas Works, May 31, 1854.

CLAY PURIFICATION OF GAS.

SIR,—In reference to the above subject, can any of your readers suggest a plan by which the ammonia which the clay extracts from the gas can be rendered applicable as a manure?

The clay or common earth is as black as a coal when it comes out of the refiners, after having done its work therein very completely; but in a very brief space of time, by exposure to the air, the ingredients which it has absorbed are volatilised, and the earth is fit for a further dose.

If the ammonia can be fixed without much expense, the earth containing it would be of very great value as a manure—perhaps more so than guano. J. H. H.

Register of New Patents.

JOSEPH CUNDY, 21, Victoria-road, Middlesex, for "*Improvements in gas stoves.*" Patent dated Aug. 30, 1853.

This invention consists in the construction of an internal chamber of a gas stove of fire-clay or earthenware. The air is caused to pass to the interior of this chamber, and to become heated therein, and then to pass out at the upper, or other convenient parts. The chamber in which the air is to be heated is placed between a double or divided chamber of metal. The earthenware chamber is contracted at its lower end, which is heated by the action of the gasburner. The heat and products of combustion rise up outside the earthenware chamber, and certain arrangements are made to divide the heat and products equally over the outer surface, so as that they may pass away by the chimney into the outer air. In order to prevent the outer metal casing becoming too heated, and, at the same time, to withdraw air from the apartment in which the stove is located, there are openings to allow the air to pass in between the outer and inner metal casings, and thence by the smoke flue into the outer air.

The inventor claims the combination of parts of a gas stove.

ARMAND LE COMTE DE FONTAINE MOREAU, 4, South-street, Finsbury, London, and of the Rue de l'Echiquier, Paris, for "*Certain improvements in lighting, by means of which the carbon escaping combustion in ordinary flames is consumed.*" Patent dated Sept. 9, 1853.

This professes to be a further improvement on a lamp patented in 1852. The improved lamp the inventor calls the lamp omnibus. The air necessary for combustion is made to pass through a metallic cloth cylinder, heated by radiation, and the method of regulating the supply of air is what the inventor claims. The invention is said to be especially applicable to mining lamps.

ALFRED VINCENT NEWTON, 66, Chancery-lane, for "*An improved manufacture of gasburner and gas regulator.*" Patent dated Sept. 9, 1853.

This invention (communicated to the patentee by a foreign correspondent) relates, first, to the employment of certain means for equalising the pressure of gas when supplied to the consumer, and thereby preserving a steady and unvarying flame, while, at the same time, the blowing or whistling of the gas is prevented; and, secondly, to the means of preventing the corrosion and clogging of gasburners.

The instrument, which the inventor terms the self-regulating burner, is composed, by preference, of white metal, analogous in composition to Britannia metal, and is formed of two tubular portions, set one within the other. The outer one carries at its upper end a jet or tip, through which the gas issues to be consumed, and the lower tubular portion forms a chamber for receiving and regulating the apparatus.

The regulating apparatus is applicable not only to all kinds of burners, but also to meters, mains, and service-pipes.

The patentee claims the apparatus for regulating the pressure of gas, the use of tips produced by punching tools, and also the regulator.

RICHARD LAMING, chemist, Millwall, Poplar, Middlesex, for "*An improved process of purifying gas.*" Patent dated Sept. 13, 1853.

This invention consists in the use of a particular combination of operations, whereby the carbonic acid contained in the gas is first wholly converted into carbonate of ammonia by the addition of alkali, and then removed by washing, and afterwards the hydro-sulphuric acid of the gas is removed by the agency of the oxide of iron. It is not absolutely necessary, the inventor alleges, for the ammonia used in the first operation to be free from carbonic acid, provided it be capable of absorbing still more; and, instead of ammonia, the hydro-sulphate of alkali may be wholly or in part substituted, because the hydro-sulphate of ammonia is decomposed by free carbonic acid into carbonate of ammonia on their coming into contact. This state of contact between the carbonic acid which exists naturally in the gas, and the ammonia with which it is intended to combine it with, is effected by the scrubber, an apparatus generally of a cylindrical form, nearly filled with pieces of coke, and gradually diminishing in size towards the top. The gas intended to be purified generally enters the scrubber by an aperture near the bottom, and leaves it by another aperture near the top. Water, or other purifying liquid, is caused to enter at or near the top, and, being distributed over the surface of the coke, finds its way to the bottom of the scrubber, where the liquid makes its exit, either finally or to be again raised by a pump, and spread over the surface of the coke—a process which

is sometimes repeated on the same portion of the liquid many times in succession. Instead of coke, the scrubber may be filled with other materials, such as brickbats, coarse gravel, or brushwood. Various mechanical contrivances are used for distributing the purifying liquid over the surface of the materials with which the scrubber is charged; and this liquid is supplied to the distributing apparatus by the pump or elevated cistern, and received after its descent into the tank or reservoir near the base of the scrubber. The scrubber, which is usually made of iron, should be of such height and diameter as that the gas which enters foul below may make its exit above purified from that particular impurity for which the scrubber is used; or deficiency in the size of the scrubber may be compensated for by employing two or more scrubbers for one and the same operation.

The purifying is finished in dry-lime purifiers, by removing hydrosulphuric acid from the gas by means of any moist oxide of iron which is susceptible of becoming changed in the purifiers into sulphuret of iron, and afterwards of being reconverted, by exposure to the air, into an oxide.

The claim of the inventor is for purifying gas by saturating its carbonic acid with ammonia, either alone or combined with hydro-sulphuric acid, or even combined with carbonic acid, in a less quantity than it can absorb, and, after removing the resulting carbonate of ammonia, in conjunction with the further purification of the gas from free hydrosulphuric acid by any effective oxide of iron.

Eliezer Edwards, of Birmingham, for "*A new and improved gas stove.*" Patent dated Sept. 15, 1853.

The patentee claims the invention of a gas stove, in which the air vitiated by combustion is conveyed from the apartment in which the stove is situated by a pipe or flue passing under the floor of the apartment.

Richard Restall, of Croydon, watch and clock maker, for "*Improvements in warming conservatories and other buildings.*" Patent dated Oct. 1, 1853.

The apparatus by which the inventor proposes to heat or warm conservatories, pits, frames, shops, counting-houses, sitting-rooms, &c., consists of an ordinary pipe, inside of which is inserted a gas jet or burner, the pipe itself being carried to the part of the building required to be heated, the extremity of the pipe opening into a flue or chimney, or into the external atmosphere, at some point below that at which the gas is ignited. The cold air entering the pipe, gets heated in passing the ignited gas, and conveys heat to those places through which the pipe passes.

Where a damp or moist atmosphere is required, the inventor proposes to place damping troughs, fitted upon the pipes, and containing water, which will be evaporated by means of the hot air passing through the pipes.

In some cases, the inventor proposes to place jets of gas outside the pipes, and claims for the mode of placing them.

Ebenezer Goddard, gas engineer, Ipswich, for "*Improvements in the construction of the regulating cocks of gasburners.*" Patent dated Nov. 3, 1853.

The invention consists in the employment of a differential burner composed of a three-way cock, the plug of which is formed with two apertures for supplying the gas to two distinct burners fitted to the top of the plug itself. One of these burners may be an ordinary burner, of any of the well-known forms at present in use, whilst the other burner must be merely a perforated tube in close proximity with the main burner. Or, instead of having two distinct burners, a similar effect may be attained by allowing the finely perforated tube to pass through the large burner, or by having one jet in the large burner isolated, so as to be supplied separately. By the peculiar construction of the cock before mentioned, the light may be turned either entirely out, or nearly so, by simply turning the plug partly round, without interfering with the ordinary shut-off cock on the gas pipe.

The inventor claims this, and also the apparatus and use of a double-way cock or valve, in conjunction with an igniting jet and luminating burner of any form, for the purpose described; and also for a system or mode of consuming gas by the use of a small jet, the supply of which is entirely independent of the luminating burner.

William Gilbert Ginty, Manchester, for "*Improvements in the mode of manufacturing a combustible gas resulting from the decomposition of water or steam, and in the construction of apparatus connected therewith.*" Patent dated Nov. 4, 1853.

By this invention the patentee proposes to produce hydro-carbonic oxide and other gases, by exposing carbonaceous materials, such as coal or cannel, coke, wood, peat, charcoal, anthracite, or iron, or any combination of them, to high temperatures, in retorts of iron or fire-clay, and passing steam over them in such a manner as to avoid, if not entirely, to a great extent, the formation of the impurity, or incombustible gas, known as carbonic acid gas.

He also proposes to effect great economical improvements in the mode of working, in the fuel, wear and tear, purification, and apparatus hitherto used in the manufacture of gas.

The inventor proposes to accomplish these results by the use of retorts of such shape and size that no part of the carbonaceous or other materials placed in them for deoxidising, or any other purpose, shall be at a greater distance than three inches from the substance forming the sides, or heating surfaces, of the retorts. The retorts, whether constructed with one or more chambers, are to have passages or compartments of not less than six feet long, for the reception of the materials over or through which the steam, water, or gas, is to pass during decomposition or generation. By this means the patentee alleges the internal temperature will be better maintained, and more uniformly distributed, both as regards space and time, and the formation of the non-combustible gas, known as carbonic acid gas, will be to a very great extent, if not entirely, avoided, and an increase in the volume of the combustible gas, known as carbonic oxide gas, effected. By this means, also, the steam usually intermingled with the gas is diminished, if not entirely removed, and a corresponding increase in heat maintained—two sources of economy, as regards fuel and the uses to which the gas may be applied.

By the use of retorts of small transverse sectional areas, and of sufficient length, a greater number than usual can be got into an oven of the ordinary dimensions, while the narrowness of the retorts effects a saving of the materials of which they are constructed, and from their compact shape they are better able to resist high temperatures and ruptures from expansion or contraction. There will also be an increase of the gas-producing power, inasmuch as all the internal parts of the retorts are sufficiently near the sensible heat of the furnace, and can be easily maintained at a suitable deoxidising temperature without excessive firing, whereas ordinary retorts, owing to their large size, allow the steam to pass away undecomposed, and carrying with it large quantities of heat. This method also effects a great saving in the cost of purifying, if it does not entirely do away with the necessity for it, on account of the small per centage of carbonic acid gas which is intermingled with the gas made in such retorts.

The inventor also proposes to accomplish these results by introducing steam into the retorts, in such a manner as to proportion or adjust the supply to the varying temperature of the retorts, and of the deoxidising substances which they contain, by gradually closing the supply tap pipe, and opening an aperture, through which the steam or water passes into the retort by means of a revolving shaft, wheel, pulley, or other motive power—the steam or water being maintained at a suitable pressure. The gradual closing of the tap or other aperture, as the temperature diminishes during the workings, renders the retorts less liable to be damaged by rapid change of temperature.

The inventor claims for the mode of treating the necessary materials, and the arrangement and construction of the apparatus referred to.

Thomas Isaac Dimsdale, gentleman, Dublin, for "*The use and preparation of certain solid and liquid substances for the defecation, purification, and deodorisation of saccharine juices and syrups or solutions, and for neutralising, decomposing, and absorbing noxious and fetid gases.*" Patent dated Nov. 19, 1853.

As peat earth, peat charcoal, and charcoal made from bituminous shale, possess, to a certain extent, the property of deodorising and purifying syrups and saccharine gases, and of absorbing noxious gases, the patentee proposes to increase this power by mixing blood with peat earth, spent tan, or any fibrous or woody matter—sawdust for example—and charring the compound by the ordinary method employed in making charcoal.

The fibrous matters, previous to their admixture with the blood, should be well washed; and, after the completion of the charring process, he recommends that they should be macerated, and then saturated with the water found in coal mines, as such water contains a considerable quantity of metallic matter in solution. The solid materials should be boiled in water, the excess of which should be discharged by evaporation.

Or, instead of boiling, there might be added powdered marl, chalk, lime, or any alkaline earth, before mixing with the (mineral) water; the mixture itself to be kept well stirred for a short time, and then allowed to subside. The supernatant clear fluid might afterwards be racked off; and, if necessary, its strength increased by the addition of fresh metallic water, the process being repeated *ad libitum*.

This mixture, the patentee alleges, will purify coal gas from ammonia and sulphuretted hydrogen, and may be used in the ordinary lime-purifiers employed in gas works, by spreading it on trays, in the manner in which lime is now used.

The inventor claims for the defecation, purification, and deodorising of the above-named gases, by the use of the aforesaid materials in a granular form.

Prix Charles Jean Baptiste Sochet, of Paris, and 4, South-street, Finsbury, London, for "*Improvements in the means of obtaining motive power by means of heated gas.*" Patent dated Nov. 28, 1853.

This invention consists in certain processes, and in the construction of apparatus, for effecting the dilatation of gases at high or low temperatures, and the application of the same to the production of an economical motive power.

The patentee proposes to effect this by the application of metallic-wire cloths, in closed chambers, heated at one end and cold at the other, for the purpose of obtaining a quick variation of temperature and pressure of air and steam, either alone or mixed together, under the ordinary pressure of, or higher pressure than, the atmosphere; and also by the heating of gases directly or indirectly by means of fire or a *balneum mariæ*, or by a direct injection of over-heated steam, or heated gas at the lower part of a wire-cloth chamber; the gases to be cooled by the injection of a small jet of water at a low temperature, acting directly or indirectly.

Parliamentary Intelligence.

SHEFFIELD GAS CONSUMERS' BILL.

HOUSE OF COMMONS—Monday, May 8, 1854.

FINAL ARRANGEMENT FOR WITHDRAWAL OF THE BILL AND AMALGAMATION OF THE COMPANIES.

The committee appointed to report to the House on this bill met this day at twelve o'clock, by adjournment from the Thursday previous.

The committee-room was nearly filled almost immediately the door was opened, there being a great many witnesses and others present.

Mr. Hope Scott, Q.C., Mr. Overend, and the Hon. A. Liddell, appeared on behalf of the Sheffield United Gas Light Company, but no counsel appeared in support of the bill; the Gas Consumers Company being represented by Mr. Coates, of the firm of Dyson and Co., the parliamentary agents for the bill.

The Chairman said the committee were ready to begin; but he wished to know whether it was proposed to enter upon the case to-day?

Mr. Overend said, Mr. Hope Scott was just robing and would be in in two minutes, if the committee would be kind enough to wait.

The Chairman: I did not know whether we were to have the pleasure of seeing you at all to-day. I thought the arrangement would have been completed without our meeting again. I have come here at some inconvenience, and it is impossible I can remain if it is intended to go into the case. It must surely be a very narrow point now left between you.

Mr. Overend: There is not much between us, sir, but we do not seem able to agree.

The Chairman: We must know whether it is intended to go into the whole case or not. We will not begin the case to-day.

Mr. Overend: It may not be necessary to go into the case, sir.

The Chairman: If it is necessary we will not go into it to-day.

Mr. Hope Scott here came into the room, and

Mr. Coates then said that on Friday last, the agents of the new company applied to their opponents to know whether they adhered to their objection to the new company having joint management of the amalgamated bill. On the evening of that day a communication was received to the effect that they did adhere to their determination. It then behoved the new company to consider whether they should acquiesce in placing their interests in the old company's hands absolutely next session, or whether to ask the committee to proceed with the bill this session, and take the chance of what might occur. They felt bound to consider the interests not only of their own shareholders but also those of the town, whom they in some measure represented. However, they could not avoid bearing in mind the resolution of the committee, expressing their opinion that, provided the public were well secured and protected, it was expedient that the town should be supplied by one gas company. It did, therefore, seem to them that it behoved them if possible to acquiesce in the arrangements of their opponents, provided they could secure the well-being of the town; and on Saturday last they wrote a letter to their opponents, specifying the terms on which they would so acquiesce. That letter was as follows:—

"24, *Parliament-street, Westminster, May* 6, 1854.

"SHEFFIELD GAS.

"My dear Sirs,—My clients think it due to the committee and to their opponents to state to you the course which we propose to adopt on Monday in consequence of the refusal of the United Company to permit the amalgamation bill of the next session to be managed otherwise than by themselves exclusively. My clients will concur in giving to the United Company the sole management of that bill provided that the Consumers' Company are at liberty to protect their own interests by petition, and by the introduction into Parliament (if they shall be so advised) of a separate bill to be pursued until the amalgamation bill shall be through the committee of the Commons, the further proceedings with it being secured by penalty. We stipulate, of course, that this arrangement shall be recognised in the deed, and that, if any difference shall arise upon this or upon any part of the draught deed, the draught shall be settled between the parties by Mr. (perhaps I had better omit the name for the present), or some other counsel to be named by you and me. If your clients do not concur in these proposals, or if the committee should disapprove of them, we shall forthwith proceed with our bill. I need scarcely say that the same motives which induce me to make this communication, will, of course, induce you to give me the earliest possible reply. "Faithfully yours,

"THOMAS COATES, for Dyson and Co.

"Messrs. J. Dorington and Co., 6, Parliament-street."

That (Mr. Coates added) was sent on Saturday.

The Chairman: Do you mean, sent to Sheffield on Saturday, or to the agents here?

Mr. Coates: To the agents here. Late on Saturday night I received the following reply:—

"6, *Parliament-street, May* 6, 1854.

"SHEFFIELD GAS.

"Dear Sirs,—With reference to your letter to us of this date, we hope that there will be no substantial difference between us as to the matters therein alluded to. The object of both parties being to carry out *bonâ fide* the committee's suggestion, and, at the same time (should that suggestion unhappily fail of completion), maintain their independence, we believe that the following short heads will most effectually serve our common purpose:—

"1. Counsel to settle finally the terms of the deed to carry out the heads of agreement between the parties.

"2. The same counsel, or some other to be agreed upon, to settle finally the draught of the bill in accordance with the deed.

"3. The United Company to promote the bill so settled. The new company to have a right to petition against it, for the sole purpose of preventing alterations in it.

"4. The United Company, in case of alterations in the bill being forced upon them after it has been deposited in Parliament, to have the right (if they think necessary) to desist from further prosecuting it; giving notice of such intention within seven days of such alteration.

"5. To guard against any undue abandonment of the settled bill by the United Company, the new company is to be at liberty, if it thinks fit, to introduce a bill of its own, which bill may be prosecuted by it in the event of the old company abandoning the settled bill before it has passed the House of Commons; but in that event the old company may be heard against the bill, if it shall think fit, and may provide for such hearing by petitioning against it in the usual way.

"6. In the event of the settled bill being passed in the House of Commons, the right of the new company to prosecute their own bill shall cease and determine, but in that case the United Company shall be subject to a penalty of £2000, payable to the new company in the event of its abandoning the bill at any future stage, except on account of alterations being forced upon it, which, in the opinion of the counsel who has settled the deed or bill, or both, shall be sufficient to justify such abandonment.

"Yours faithfully, "J. DORINGTON, ELLICOMBE, and Co.

"Messrs. Dyson and Co., 24, Parliament-street."

The short issue (added Mr. Coates) between them now was this: that the United Company reserved to themselves absolutely the discretion of withdrawing the amalgamation bill next session.

Mr. Jackson: Did you not say that the barrister must concur in that?

Mr. Coates: We would concur on this condition.

Mr. Jackson: There is a condition.

Mr. Coates: But they take an absolute discretion of withdrawing the bill. If they withdraw that bill in the Lords, then, we not having continued our bill according to this proposition, up to that stage, shall have no voice in it; but, if the barrister in question states that they have wantonly withdrawn the bill, they are to pay us £2000. They are, I understand, willing to pay any sum the barrister may think fit.

Mr. Hope Scott: No, I did not say that.

Mr. Coates: Then we will deal with it as a question of £2000. The issue between us is this:—We say we are absolutely in their hands next session. They may carry in their bill in the House of Commons (and I would say I do not mean to cast upon them the slightest imputation, for in the course of a few hours I hope they will be good allies of ours), but they may wantonly exercise that absolute power by withdrawing the bill in the House of Lords, and then it will be too late for us to proceed with a bill that year. Now, gentlemen, knowing what has occurred, and knowing also the temper which exists, do not let us return to Sheffield with such a point as that unsettled. Do not let it be said that we have not protected the public interest as well as our own; do not let it be said that we have put ourselves absolutely into their hands, except so far as regards this penalty of £2000, and which will be a benefit to them, because they will realise more money by so doing, by the suspension of our bill for another twelve months. Let some impartial person, some one who has drawn the deed or bill, and who knows the whole policy of both companies, determine whether it is fair to withdraw the bill or not. That, gentlemen, is the short issue between us.

Mr. Jackson: Now, Mr. Scott, the matter is drawn to a very narrow point now.

The Chairman said he wanted to know whether it was the intention to proceed with the bill or not; because if it were he must go to the Speaker and ask him to be good enough to appoint a fresh chairman, as he had other duties to perform that day.

Mr. Roebuck: I think they are not going into the case, only into the point raised.

Mr. Hope Scott: The United Company have done all they could to bring this matter to a conclusion. The new company having given up the point about the joint prosecution of the bill, the only difficulty that remains is as to their being sufficiently protected. They say they will give to us the sole management of the bill, providing they are at liberty to protect their rights by petition. Now, if we give them an unlimited right to petition against the bill, we shall have an endless discussion. We meet that objection, then, by proposing that the counsel who shall settle the deed of agreement shall also settle the bill. The next question is this. Supposing the bill to be unaltered in any way, we are bound to prosecute it, and have no right to withdraw it; but the bill may be altered, either at the instigation of the new company, or by third parties, or by the authorities of the town, or the committee, so that it may materially affect the interests of the old company. The interests of the old company are different from the interests of the new company. The new company by their bill propose a low charge for gas, and a low rate of a dividend, and they may submit to an alteration of the bill in that direction to which we cannot submit. We refused to give them the joint prosecution of the bill because of this difference of interests. Then, again, if alterations are forced on us, how are we to act? We claim to ourselves the discretion to refuse to proceed with the bill if those alterations are material. They reply that they must be protected in some way or other from an arbitrary exercise of that power on our part; and what they propose is, that they shall introduce a separate bill—any kind of bill they think fit—and that that bill shall be pursued until the amalgamation bill shall be through the committee of the House of Commons, and its further proceeding be secured by penalty. Upon that we propose to give seven days' notice of our intention to abandon the bill; and, to guard against the undue exercise of that power, the new company to be at liberty to introduce a bill separately. Then there arises this point of difference. We reserve to ourselves the right to petition against their bill in the event of our deeming it necessary to withdraw our bill; and it is quite plain, in that event, that we ought to be heard against their bill, and for this reason. Supposing the present arrangement should fall through by the action of third parties, it is plain that neither party ought to be damaged by that. They think they can pass their bill, and we think we can throw it out on the merits. We ought not, then, to be put in a worse position than we are now in. Each party should be in a *statu quo*.

Mr. Jackson: I would throw out this suggestion. Cannot you agree amongst yourselves what shall be good and sufficient grounds for the old company withdrawing their bill? Supposing the committee shall say that you shall not raise the capital as now agreed upon, that gas shall be less than 4s. per 1000, and that the dividend be less than ten per cent., cannot you agree to make these or either of them good cause why the bill should be withdrawn, and that you should come again the year after that as entirely a new question?

Mr. Hope Scott: I think we can come to terms on this bill; at least we could propose terms, but we are in this difficulty. We find that at a meeting of the directors of the new company, that, though they agreed as to the amalgamation, yet they were of opinion that the maximum price of gas should be 3s. 6d., and that the dividend should not exceed 7½ per cent. It would be easy enough to agree that certain organic changes should be good reason for our withdrawing the bill.

Mr. Jackson: What do you say, Mr. Coates, to those three elements being held as good reason for the bill being withdrawn? It is quite clear that the old company should not, if the bill were withdrawn, be in a worse position than at present.

Mr. Coates: You should bear in mind that every year which elapses without our being incorporated, or having the power to supply the town of Sheffield with gas, will bring an enormous pecuniary gain

to the old company; I am told £8000 or £9000 a year. Let them get over May, 1855, then withdraw their bill, and then we get to 1856, before we can come to Parliament, when we may be completely ruined, while they are vastly benefited.

Mr. JACKSON: If the bill be withdrawn on these three points—capital, price of gas, or dividend, that will most likely proceed from the power which the new company exercises in the corporation of Sheffield.

Mr. COATES: I do believe that that is the supposition entertained by the learned counsel and their clients on the other side.

Mr. JACKSON: When I made that remark I did so without reference to what has been stated by Mr. Hope Scott, but from my own observation of what has taken place. Some doubt arose in my mind whether the corporation might not say that gas should be 3s. 6d., and the dividend 7½ per cent., and that there might be grounds for the committee saying the same.

Mr. COATES assented to any alteration of the three points named being considered good cause for the bill being withdrawn. In that event the new company to pursue their bill separately for incorporation, and that the old company have power to oppose it.

Mr. JACKSON: Are you content with that?

Mr. HOPE SCOTT: We are content.

Mr. COATES: But if they pay us no penalty we shall lose a year, and they will gain a year, and be in as good a position before Parliament as they are now.

Mr. HOPE SCOTT: Mr. Coates has taken every part of my proposition, and applied it to the new state of things. What we want to guard against is, an undue abandonment of the bill, and to agree upon certain organic changes being considered good cause.

Mr. ROEBUCK: If the committee determine that gas can be sold at 3s. 6d., that is no reason why the old company should alone have a bill for ever.

Mr. HOPE SCOTT: Not at all. We propose merely that the bill shall not be gone on with that session.

Mr. ROEBUCK: What is the difference, except to you?

Mr. HOPE SCOTT: Suppose we meet a committee—and it is not every committee that understands the commercial question of making gas—and the committee determine that 3s. per 1000 is sufficient, then we should withdraw our bill; but what chance should we have of opposing the new company's bill before a committee which had already decided that 3s. per 1000 was sufficient?

Mr. ROEBUCK: Then you mean to say that your opinion is better than that of the House of Commons. (Laughter.)

Mr. HOPE SCOTT: Oh, no!

Mr. ROEBUCK: Oh, yes! If the committee were to say that gas can be sold at 3s. per 1000, I should think the committee were right.

Mr. HOPE SCOTT: But we are now agreeing that 4s. is the right price.

Mr. ROEBUCK: But you must bear in mind that that committee would determine upon evidence. This committee has determined without it. That is a material point.

Mr. JACKSON: We determine nothing. We are merely acting as friendly mediators. If the case proceeds, every one must see that I cannot act upon the committee. It is utterly impossible.

Mr. HOPE SCOTT: I think I can now put the matter in a more direct form. We propose that a certain number of points shall be now settled as being points, which being deviated from, by any extraneous force, shall absolutely justify us in withdrawing the bill. We will refer to the counsel who settles the bill any other point of alteration, not now specified, on which we think we ought to withdraw. The arbitrator shall have the absolute power to say whether we ought to withdraw or not. If we withdraw without his consent he shall have power to award any penalty not exceeding one half-year's dividend. I do this to show that there is no *mala fides* about us, or I would not name so large a penalty, for it will be equal to about £5000. Of course the new company must not prosecute a bill next session.

Mr. COATES urged that the new company should have power to bring in a bill next session; then they would be agreed.

Mr. JACKSON: It seems now that the only question to decide is, whether you shall prosecute your bill or not next session. You want both penalty and power to go on with your bill.

Mr. COATES: Not at all. I am willing to concede the penalty, if we are allowed to go on with our bill. Suppose it should be determined that there is sufficient cause for the bill being withdrawn, is the public of Sheffield to be deprived for two years of the benefit of competition in gas by our receiving a penalty of £5000?

Mr. JACKSON: I thought you did not represent the public of Sheffield.

Mr. COATES: We do to this extent. The corporation petitions in favour of our bill; the town clerk is here as my witness, and is now in this room; and I hope I shall be able to show that we do represent the interests of Sheffield if we are allowed to go on with our bill. It is not, therefore, a hardship to be in the hands of a company against whom the public do complain. However, it is in the hands of the committee to determine whether this bill shall go on or not next year.

Mr. JACKSON: In order that the public of Sheffield may feel that justice is done to them, will the old company at once undertake, so long as this question is unsettled, to charge no more than 4s. per 1000 for gas?

Mr. HOPE SCOTT: We agree to that.

Mr. JACKSON: Then the public is satisfied.

Mr. COATES: No doubt, to that extent.

Mr. JACKSON: Now, the question is entirely between the two companies. If the three points named are interfered with, then the bill shall be withdrawn, if the old company think fit, and both parties shall be at liberty to come to Parliament the succeeding session. In the mean time, I am sure the corporation will see that their interests have been protected. If this arrangement is carried out, the public will be better served than by having two companies, and in the mean time, till the matter is settled, they will be gainers to the extent of gas being kept down to 4s. per 1000.

Mr. HADFIELD: I am sure that unlimited confidence may be placed by the parties in each other. I do not think, if all Yorkshire were searched, more respectable professional gentlemen could be found than those who are engaged in this case.

Mr. COATES: Then I understand that the resolution of March 29 is to be adhered to, namely, that it is expedient for the lighting of the town to be confided to one company, and that these are the considerations upon which we now suggest that our bill should be withdrawn: Counsel to be determined upon by the agents for the petitioners and by myself finally to settle the terms of the deed, and to carry out the agreement between the parties. That the same counsel, or another to be agreed upon in like manner, shall settle finally the draught of the bill to confirm the deed. The old company to promote the bill so settled, and the new company to have the right of petitioning against it for the sole purpose of preventing alterations. The old company, in case of any alterations of the bill which shall reduce the capital below the sum already named, the price of gas below 4s. per 1000, and the dividend below ten per cent., or any other matters which, in the opinion of the counsel who shall have drawn the deed, shall be deemed sufficient, having been forced upon the old company, after the bill has been deposited in Parliament, shall have the right to desist further proceeding with the bill, notice of such intention being given within seven days after such alteration. And, to guard against any undue alteration of the bill by the old company, the new company to be at liberty to introduce a bill of its own.

Mr. HOPE SCOTT (interrupting): Oh, no! I did not agree to that.

Mr. COATES: The next point is this:—Suppose the old company withdraw their bill for any reasons other than those above assigned, or those which the arbitrator shall deem sufficient, the old company to pay to the new company any sum not exceeding one half-year's dividend. That henceforth, and during the prosecution of the bill in Parliament, either during the next session, or if the old company should withdraw their bill during the year after, the old company to charge only 4s. per 1000 for gas.

Mr. JACKSON: I think they ought to go a little further, and comply with the conditions laid down for amalgamation in respect of the price for gas, auditing the accounts, and the charge for meters, &c. I would put the public in the same position as if the new company had got their bill.

Mr. HOPE SCOTT: I am afraid we cannot comply in all those respects.

Mr. JACKSON: I mean, of course, as far as you can possibly.

Mr. HOPE SCOTT: We have no objection to do that as far as practicable, and as far as our act of Parliament will admit. There is another point which should, I think, be included amongst those in which there is to be no organic change, namely, the allotment of shares.

Mr. JACKSON: Oh, of course, that is only fair.

Mr. ROEBUCK said he would now read the resolution which had been passed by the police commissioners of Sheffield. He would do so in order to put them fairly before the committee, though he did not agree with the resolution in any way himself. The resolution was to the effect that if, as the directors of the old company had expressed, the town council would be precluded from opposing the amalgamated bill next year, the same objection would equally apply to the police commissioners; and, therefore, they now declared that they should oppose any increase of the price of gas, because thereby their facilities for lighting the town would be decreased.

Mr. COATES: One alteration as regards the penalty has been acceded to. Instead of the penalty being any sum not exceeding one half-year's dividend, it should be a fixed sum.

Mr. JACKSON: Just so. I was thinking they might have no dividend.

Mr. COATES: Then let the sum be fixed at £5000.

Mr. JACKSON: Are you content, gentlemen?

Mr. OVEREND: Yes.

Mr. COATES: My clients acquiesce, but I must say that they think they suffer by not pursuing their bill.

Mr. JACKSON: Considering all the circumstances, I think not. Under this new arrangement the public will be well served; the new company get out of difficulties into a good fixed position; and the old company will be free from competition, and all will go on well and quietly.

Mr. ROEBUCK: That assumes that the bill passes; but if the bill do not pass I fear the public will suffer.

Mr. JACKSON: We have made arrangements so that the public will not suffer. So long as this dispute is unsettled the old company are bound to comply, as far as possible, with the terms now made, just the same as if the sanction of this committee had been given to them this day.

Mr. OVEREND: And we are willing to enter into any contract with anybody to that effect.

After some further discussion, the committee-room was cleared, and in a few minutes the parties were again admitted, when

The CHAIRMAN said, the committee are of opinion that the new company should not prosecute a bill next session.

Mr. COATES: I will now ask the committee to adjourn *pro forma* till the agreement is settled. From this moment, the will of the committee having been expressed (I do not, I assure you, desire to throw the least imputation on the gentlemen who will now be my allies), but from this time there is no hold on the United Company whatever for executing the agreement except by keeping our bill hanging over them. I propose that the committee should adjourn for a month, and that they should not be called together if the agreement should be signed in the mean time. Then the new company's bill to be withdrawn.

It was arranged that the committee should adjourn *pro forma* till June 15.

The proceedings then terminated.

SUNDERLAND SUBSCRIPTION GAS COMPANY.

HOUSE OF COMMONS—Tuesday, May 16, 1854.

Sir Robert Price, Chairman.

This was a bill brought in by the Sunderland Subscription Gas Company, for extending their works, enabling the company to raise a further sum of money for better supplying the borough of Sunderland and neighbouring places with gas, and for other purposes.

This company was formed in 1831, for the purpose of supplying Sunderland and Bishop Wearmouth with gas. It is now regulated by a deed of settlement (dated 1842) which provided that the capital of the company should be £6000, divided into 600 shares of £10 each, and that the same might be increased by the creation of new shares, and which sum of £6000 has been fully paid up. In August, 1846, and also in December, 1850, the capital of the company was successively increased in pursuance of the powers contained for that purpose in the deed of settlement—making the entire capital £13,500. In June, 1848, the company was completely registered, and became incorporated. They expended in the purchase of land, and various erections and works, £6750 of profits, instead of dividing the same among the shareholders. They now sought powers to consolidate this last sum with the former, into a capital of £20,200, to extend their works; to raise, by the creation of new shares, in addition to the existing capital for the time being, any further sum or sums of money, for the purposes of the company, not exceeding in the whole the further sum of £50,000, and a borrowing power equal to one-third of the capital.

The bill was opposed by the Sunderland Corporation Gas Company, by the local board of health, and some of the inhabitants.

Mr. Parks, agent on behalf of the petitioners against the bill, said: I appear here on behalf of the opponents of the bill. The principal opposition is on behalf of the Corporation Company, but since this bill came before Parliament, arrangements have been in progress for the consolidation of both companies into one. We have, therefore, adopted the initiative in the matter. The directors of both companies are unanimous on that subject, but before the matter is finally settled it must be submitted to the proprietors in public meeting assembled. This meeting cannot be called till Monday fortnight. We anticipate from that meeting a favourable result. We expect that the proprietors will consent to withdraw this bill, in order that a bill may be brought in next session to consolidate both companies. No party will be injured by the postponement—the only thing to be considered is the convenience of the committee. I have therefore to request them to adjourn this case till Thursday week.

The Solicitor to the Subscription Gas Bill said the shareholders of the company were unanimously in favour of the amalgamation. The directors must, however, call a meeting to obtain the sanction of the proprietors, and I am persuaded we will have no occasion to appear again before you as promoters of the present bill.

The case was then adjourned till Thursday, June 1.

TORQUAY, TORMOHAM, AND ST. MARY CHURCH GAS BILL.

HOUSE OF COMMONS—Tuesday, May 16, 1854.

Before Sir Robert Price (Chairman), Mr. Christie, Captain Gladstone, Mr. John Ramsden, and Sir J. Yarde Buller.

This was a bill to incorporate a company for the purpose of lighting with gas the parishes of Tormoham and St. Mary Church, in the county of Devon.

The company proposed to raise a capital of £8000 in 1600 shares of £5 each, with a borrowing power of £2600. The bill contained no restrictive clause with respect to price.

Mr. Sergeant Merewether and Mr. Rodwell appeared on behalf of the promoters; and Mr. Jones for the existing company, which opposed.

Mr. Sergeant Merewether, in opening the case, said: I have the honour to appear before you on behalf of the promoters of a bill to light with gas the parishes of Tormoham and St. Mary, in the county of Devon. The preamble recites:—

"Whereas the towns of Torquay and Tor and the parishes of Tormoham and St. Mary Church, in the county of Devon, are at present very insufficiently supplied with gas: And whereas the convenience and advantage of the inhabitants of the said parishes would be promoted, were a company established and authorised to construct gas works for supplying the said inhabitants upon the terms hereinafter mentioned: And whereas the several persons hereinafter named, with others, are willing, at their own expense, to undertake the construction of such works, but they cannot well do so without the authority of Parliament."

That is a very short preamble, and I think I shall have no difficulty in convincing you that those parishes are very insufficiently supplied with gas; and, if you think so, then you will not refuse to invest with powers a company to give a better supply. It is called the Tormoham Gas Bill, because this name is much more familiarly known than Torquay. Torquay has within the last few years sprung up with a growth most amazing. In 1801 the population only amounted to 800; in 1821 it rose to 1800; in 1831, to 3000; in the next 10 years (1841) it became 6000; in 1851 it increased to 11,640, or nearly double the number it attained to in the previous period of 10 years. At present I believe I should not be over-estimating the population if I called it 14,000, with a population adjacent of 4000, in a small watering-place, which is also rapidly increasing in numbers. Torquay is a purely residential place resorted to by persons suffering under complaints. It was a tract of waste land which has been utilised by the erection of villas, and just the place above all others suited to those whose means would enable them to resort to places provided with things formerly deemed luxuries, but which are now ragarded as necessaries of life. One of these luxuries, and an important one, is gas. The history of gas in this locality is this:—Up to 1834 the supply in Torquay was from oil alone. They had then those dim lamps which were only sufficient to make darkness visible; but in 1834 a party of respectable individuals united, and, by placing 391 £5 shares together, they created a capital of £1955, which they invested in gas works. They originally started for the purpose of supplying the town of Torquay, and they erected their works at Torwood, the property of Sir Lawrence Palk. He and Mr. Carey held nearly the whole of the property in the parish of Torquay and Torwood. The possessorship by these gentlemen of this property leads to a line of demarcation between them which will call for some observations in the course of this case. In 1841 the parties to this private arrangement removed their works to a place called Lower Union-street; and one of the chief reasons and grounds of objection to the company, besides other matters of incompetency affecting those parties, was their taking up their station in Lower Union-street. That street has since become very populous, and therefore the works have been looked upon as a nuisance. The comforts of many people have been affected by the refuse of the gas going into the water. But there are other reasons why this place is undesirable for gas works. You are aware that the most desirable place for the erection of gas works should be the lowest level. At the lower part of the map [which was produced] you will observe a place called the Strand, which is the chief centre of gas consumers, and which is at a level of 60 feet below the station in Union-street. But, as a matter of local history, I may as well tell you what the government of Torquay has been. Up to 1849 it was governed by the provisions of the local act of 1835, by which 18 commissioners, with a chairman, were appointed up to 1849; these were the only authorities at Torquay. Torquay is one of those places which subsequently, by provisional orders and by an act of parliament, became incorporated. One of the reasons I have for adverting to this is as follows:—You are aware that the Board of Health in the metropolis are in the habit of sending their inspectors to different towns to collect information as to their local necessities and sanitary condition, and report to the authorities in the metropolis. In compliance with this arrangement, a Mr. Rammell was sent down to Torquay. He reported in February, 1850, and an act was passed in August of that year, making the commissioners the local government of the town. In page 15 of his report Mr. Rammell says—"The town is partially lighted with gas by a private company formed in the year 1834. The capital was at first £1955, but it has since been increased to £4000. During the first few years the undertaking was so unprofitable that many shareholders forfeited their shares. The speculation afterwards became remunerative, and paid 7 per cent. The average dividend is 7 per cent. now, but on the old stock it is probably 10. The public lamps are charged £3. 3s. per annum, and it was stated that the consumption of each was between 8000 and 9000 feet per annum. The price to private consumers was 9s. per 1000 cubic feet." In candour to the opponents of the bill, I must say that there has been a reduction. "The inhabitants of the outlying districts complain of the want of light." This was in 1850. He then went on to state that "parts of the town were dangerous from insufficient light; in Torwood and Park-hill, for instance, there were many dark passages, where the police were not able to act effectively. Some years ago a robbery was effected there, the thieves being favoured by the obscurity of the place. No public lights were erected, except where the gas company had laid their mains; and, as they had supplied the public lights at prime cost, they had no motive for extending their mains farther than they had private consumers." The gas proprietors, therefore, supply those localities which were most profitable, leaving other places wholly unprovided. Mr. William Kitson, in his evidence, admitted that the present position of the gas works (Lower Union-street) was not the best; and he is the head and front of the opposition to this bill. Many complain that the gas works are a serious nuisance, inasmuch as the refuse of the gas flows into their wells, and renders the water impure. Mr. Rammell, in his report, quotes many witnesses on this point. Now, after giving you this local history, let me call your attention to the matter immediately under your notice—that is, to the proposition of other parties to supply better gas, and the grounds on which they support their objection to the existing company. The committee know that there are two elements necessary in gas supply, namely, quantity and quality. That means that the quantity must be adequate, or the necessary supply might fall short, and the article must be good. Now, I will show that the works of the existing company are inadequate for the present supply of Torquay, and how much more so for the future supply. I will produce a man who is at present consuming this gas, and, owing to its inadequacy, he is obliged also to use candles. Now, recollect this is 1854—a time when we are supposed to have made some progress in gas lighting, and when there are very few places in the kingdom obliged to go back to the old barbarous system of lighting by candles. That will be told you by more than one witness. I shall also produce a man who every Saturday night has to read for his entertainment, and that he cannot have the use of gas to enable him to obtain the important information contained in a periodical. This is a matter of very serious moment to Mr. Wolfenden, who will tell you that in reading his *Bell's Life*—a good, cheap, and pleasant paper—he is obliged to have his candle. (Laughter.) Well, that, of course, is a trifling and almost absurd instance, but I put it to you to show that the quantity is inadequate. I admit that those gentlemen, the gas proprietors, are doing their best. They have only got certain sized mains; and with a certain quantity of apparatus they can only supply a certain quantity of gas. Their lamps also are so far apart that they are practically useless. Now, if people are pretending to light a place, such a ground of complaint should not be allowed to exist. I could go into many facts and details, to show the inadequacy of the supply; but it would be unfair in me to waste your time by giving you in a speech that which the witnesses will tell you. Now, as to the quality, the witnesses will tell you that the gas is impure—that it makes a crust on the walls that you could scrape off

with a knife. The smell is also very offensive. This will not rest on light testimony. You will have a clergyman of the parish, and shopkeepers of various classes, coming to prove it. You will have it also proved by chemists and men of practical knowledge, who have tested the quality of the gas; and, although no tests are better than a man's eyes and nose, yet chemical tests will be used to show the impurity and unpleasant character of the gas. That is the condition of the company as regards the quantity and quality of the gas. I am not standing here to show that those who have hitherto done so much for Torquay are wholly to blame in this matter. Part of my case is, that there is no use in these old gentlemen talking of their gas works, because there is a great and manifest infirmity in their resources. I am willing to concede, for the sake of argument, that they have done their best; but their works are inadequate, and I can hardly blame them for that, because those works were constructed in a time when they were but partially acquainted with such matters. But if the other side should say, "Oh! we admit that these are not good gas works, but, by an outlay of some money, they may be made good gas works," I can show that there is no prospect of their being able to make them better. If I prove that, I shall prove what I call the physical part of the case. But there are other matters which a counsel opening the case for the bill ought not to pass over. I told you that these are private parties. That is no reproach, for, on the whole, private parties are more accessible to approach than corporations, who are said to have no conscience; but private parties, undertaking works of this kind, are hampered and trammelled for want of sufficient powers. It is most important that a gas company should have a competency of power to open the streets for the purpose of laying down mains. Without such power they are left to the mercy of surveyors of highways and other capricious individuals, who may stand in the way of that which the gas company may desire to do. To remedy this defect, the Legislature passed several important bills—the Railway Clauses Act, the Land Companies Clauses Act, and the Gas Clauses Act—in which these matters are provided for. As regards the public, there is a compulsory power of equal importance; for private parties are not compellable to supply gas; and it is important that, if they should be enabled to open the streets for their own use and benefit, they should be also obliged to supply the gas to those that required it—it should not be a matter of caprice. Now, it is most desirable that this should be the case in Torquay. Here is an outlying district, in which villas are springing up from time to time, and the nature of these villas is that, there being plenty of space, the houses are not built in rows, but each house has four or five acres of ground surrounding it. The present company, therefore, have no inducement to go so far to light those houses, and the public have no compulsory powers to make them do so. The old company went on for a certain time very fairly, in supplying houses within a small space; but that which they have done for a very few houses in Torquay we propose to do for an increased and increasing population. But it may be said, "That can be remedied. Those persons can be put on their legs. They can have an act of Parliament, and be invested with those powers which you say is so necessary and desirable." Well, but people must be dealt with according to their antecedents. In 1850, Mr. Rammell, inspector of the Board of Health, told these people that their works were bad. Two sessions of Parliament have since intervened, and they have not come to Parliament for the necessary powers, and I apprehend it will be too late, when other parties have been driven to the necessity of constructing a company and coming to Parliament, for the old company to come here and say, "We will now do all that you propose to do." I started by saying that they cannot supply Torquay, and they do not do so. The supply at present in Torquay is not adequate. Then there is a considerable estate already in progress of being turned into Kent-town. That is a large plot of land which has been taken for building purposes, and is being built upon. If the present company cannot supply the existing demands now, will they be able to supply the future? and must not somebody else—a fresh and more vigorous body—be created for that purpose? I would rather place my objections on public grounds than by an *argumentum ad invidiam* as against those gentlemen. But they have not kept pace with the requirements of the locality. Even if they had the will, they have not had the means. But there can be no doubt that, besides the want of means, there had not been that full perfection and completeness of will which would justify them in their opposition to the bill now before the committee. Having called your attention to the state of things generally, one word for the opponents of this bill. There are three petitions against the bill (there are also some in its favour), the old company, some of the inhabitants, and the local board of health. Now, in Torquay there are differences of opinion, and, although B may not have much of an opinion of his own, yet he may wish to act contrary to that of A, and be thus saved the trouble of forming an opinion of his own. That is the case at Torquay; and, consequently, some inhabitants petition against the bill just because others are in its favour. Then there is the old gas party—they petition, of course. They say they do not like any one to make gas but themselves. That is perfectly natural. These two petitions one can understand; but the third petition I cannot understand. I told you that the General Board of Health established a local board of health at Torquay. Now, the opinion expressed by the local board would naturally have much weight, and therefore in reading my brief my attention was particularly called to it. But they involve themselves in an inconsistency, for the burden of their song is, that it would be inexpedient to sanction the new company, inasmuch as it would involve the outlay of two capitals instead of one; and also the inconvenience of taking up the streets to lay down two sets of mains, pipes, &c. Well, that is a tangible objection. But they go on to say, "We must also tell your honourable House that we intend to lay down pipes ourselves, and supply the place with gas, as we are already answerable for supplying the public lights." That is an inconsistency, for they propose to do that themselves which they want you to refuse powers to others to do. But when I find that Mr. Kitson, who is the head and front of the old gas company, is the most active gentleman on the local board—when I find that he and his family are interested beyond all others in the monopoly of the old company—when I find him arguing on behalf of the local board in opposition to this bill—I am not disposed to think that you will attach much weight to their petition. Now, I think I might, according to strict parliamentary rule, object to the *locus standi* of the gas company here; but I will not do so, because, in the first place, there would be an argument on that point between my learned friend and myself, and he, of course, would rejoice in the opportunity of holding an argument; and, secondly, as any inhabitant might claim the same privilege, your time would be unnecessarily wasted by hearing the same thing over again. I have told you what the shortcomings of the old company are, and what their want of means. But they may say, "It is not our fault—we have done our best"; but I say, "You are a poor old decayed gas company, which might have done very well in the ancient barbarous times; but you are not able to meet the requirements of the present age. You may have struggled hard to do better, but still your gas has escaped. It will stick to the walls, so as that it may be scraped off with a knife. A man must have a candle to read his newspaper, and therefore a new, fresh, and vigorous company is required." If the committee think that Torquay wants better and improved gas, then, though it may be unfortunate to have gentlemen exposed to competition who have hitherto supplied the place imperfectly, still that will not cause you to refuse to this new company the privilege of doing that for the town which the old company failed to accomplish.

Thomas Parr, examined by Mr. RODWELL.

I reside at Torquay, and have been concerned in laying down the mains there. I am well acquainted with the gas works. They are in Union-street, and behind my house. The level is considerably higher than the Strand. I remember Mr. Rammell coming down to Torquay. I was examined before him. I made complaints to him of the gas. The first complaint I made was some time before he came down to Torquay. I complained of the injury done to the water by the gas works. I think it is very unfair, and a hard case, to have gas works brought behind a man's house. I have been supplied with the gas, and consider it bad. Here is a glass—[producing the chimney of a burner]—that has been on ten weeks. The burner to which that glass belonged was in my dining-room. [The glass was quite black, and thickly encrusted with carboniferous deposits.] I have been much annoyed by the smell of the gas. I have not received a sufficient supply, and I attribute the deficiency to a want of pressure. I have been over the works, and consider them far from what they ought to be. I think they have not sufficient apparatus for making good gas. I think a new company is required, because gas works ought not to be in the midst of the population; they are injurious to health. In my judgment, Babbicomb-bridge, the site on which the new company propose to erect their works, will be more convenient; and the gas, being made there, would not affect the health of the inhabitants. I am a shareholder in the old company.

Cross-examined by Mr. JONES: There are persons in Torquay who are obliged to buy their gas from the company whether they like it or not. Many persons there cannot think for themselves. I am one of those persons. (Laughter.) My house was built in 1834 or 1835. I have lived there nine or ten years. All property there has increased in value, notwithstanding the proximity of the gas works. I made complaints of the nuisance arising from the gas works when Mr. Julian was manager. I believe he was dismissed for neglect, and he is now connected with the promoters of this bill. I complained about a fortnight ago that the gas works were taking the water from my well. I know there are more complaints than two. There are many who dare not complain. The gas company are now drawing away my water. The common sewer runs near my house. It is at the end of my premises. The gas works are below the level of my premises, and the common sewer runs between the gas works and my premises. The company are making new tanks, and have been carrying on new works for some time past. I have not taken any shares in the new company, and will not until they get their act. I have been short of gas in foggy weather. If the works were properly managed, the company would have double the dividends they have at present. I do not know what their charge for gas is. I consider the site proposed by the new company most desirable for gas works. It is about three miles from the town.

Re-examined by Mr. MEREWETHER: Mr. Julian had a dispute with the old company. There is a man named Wadland connected with the old company, and no one can act under him.

Do you represent the proprietary of the old company?—The propriety? (Laughter.)

Mr. JONES: I beg leave to say that the witness does not represent the propriety of the old company.

Witness: The water is not fit for use, being impregnated with coal gas.

Mr. *Fisher*, examined by Mr. MEREWETHER.

I am a chemist and druggist, carrying on business in Laurence-place, Torquay. I am a gas consumer. The quantity is deficient, and the quality bad. The light is yellow. I complained to some of the directors of these defects. I have eight burners in my shop, and could only get light from five of them. If I lighted them all, the light would not be strong enough. I have been ill, and my assistant also, from the offensive smell of the gas. I have been affected with gastritis. (Laughter.) Medical men frequently complained in my shop of the unpleasantness of the smell. The Messrs. Stark, directors, to whom I complained, sell lamps; and, finding the gas so very bad, I went to them to buy oil lamps. They told me to use the gas for another fortnight, and I should find it better. It did improve a little after that. I never saw the present gas works, but I smelt them. They are situated in a populous part of Torquay. I should like to see the gas works outside of the town.

Cross-examined by Mr. JONES: I am a shareholder in the new

company to the extent of £50. I suffered from gastritis last autumn, and attribute it to the gas. I am not aware that that complaint is prevalent in autumn.

Mr. Henderson, one of the members of the Board of Health, and secretary *pro. tem.* to the new company, examined by Mr. RODWELL.

I know several instances of parties wanting light who cannot get it. The company are unable to supply gas to the extent required. Torquay is a place rapidly increasing in buildings and in population. There is a petition from it in favour of the new company. That petition, to the getting up of which I have been a party, is signed by all the principal consumers: 126 consumers out of 250 have signed it. Looking at the situation of the gas works, I should say, in a sanitary point of view, a worse site could not be selected. In my judgment it is necessary and desirable that there should be a new company, not only for the town of Torquay, but for Tormoham and St. Mary Church. If this bill passed, there would be no difficulty as to the taking of shares. The quality of the gas of the present company, and the works, are a great nuisance.

Cross-examined by Mr. JONES: I am a member of the local board. It consists of 10 members, all of whom voted in favour of petitioning against the present bill except myself, but then the local board are shareholders in the old company. I consider the present company unable to meet the requirements of the place. Their own engineer states in his report that their present works will only last three years.

The CHAIRMAN: We think it quite clear that there is not a sufficient supply of gas at present. Whether the town might be better supplied by another company, is another question. Perhaps it would be better if both parties came to some agreement.

Mr. JONES: We trust that, when you have heard even a part of the evidence we shall lay before you, you will be satisfied that we are able to do all that is necessary.

The CHAIRMAN: Is there any chance of an amalgamation?

Mr. JONES: I am not aware.

Mr. Sergeant MEREWETHER: We should be delighted to entertain any suggestion of the kind.

Sir J. Y. BULLER (addressing himself to Mr. Jones): Is it not almost apparent to you that a company, under an act of parliament, would carry on the business of gas lighting more advantageously to the town. You have not come here at all; and is it not possible that, by this company coming here for an act, something better would be done?

Mr. JONES: There is no doubt that this suggestion would, if adopted, result in an amalgamation; for, the population not being able to maintain two companies, it is probable that, after a good deal of controversy and expense, with which the town would be eventually saddled, it would result in an amalgamation at last.

Sir J. Y. BULLER: Don't you think you might bring about this amalgamation without saddling the people with all this expense?

The CHAIRMAN: The longer you maintain the controversy, the more somebody must pay for it. The committee are most willing to hear the whole case, as we are bound to do; but as the other party who are the aggressors here, as they are treading on ground already occupied, are ready to receive overtures, perhaps some consultation during the evening might lead to some good result.

Mr. Sergeant MEREWETHER: We are no more the aggressors here than a medical man would be who was called in to attend a patient in case of fever. I think the suggestion which has fallen from the committee very kind, and one which ought to be frankly met on both sides. All we want is equitable terms, and we are ready to meet them on fair grounds.

Mr. JONES: Having consulted with the opponents of the bill, I am authorised to state that we are ready to receive any overtures from the promoters. We consider that the suggestion of the committee merits our best attention.

Mr. Sergeant MEREWETHER proposed that both parties should communicate on the subject during the evening, and be ready to lay the result of their negotiations before the committee the next day.

The committee acquiesced, and adjourned till twelve o'clock the next day.

WEDNESDAY, MAY 17.

The committee met this day for the further consideration of this matter, and heard the evidence of Mr. *E. B. Julian*, the engineer of the company, and of Mr. *T. A. Hedley*, in support of the bill.

Mr. TUCKER (solicitor) opened the case on behalf of the opponents, and called several respectable inhabitants to prove that since November last, when a new manager had been appointed, they had been amply supplied with gas, and had had no cause for complaint. Some merriment was created by the fact of one of the witnesses having signed the petition in favour of the new company, and now coming forward on behalf of the old company.

THURSDAY, May 18.

At the meeting of the committee this morning, it was announced that an arrangement had been made for the sale of the works of the old company to the new company, and the petition against the bill was, consequently, withdrawn. The preamble was then passed, and the clauses agreed to with some slight amendments. It was rumoured that £7250 was the sum agreed to be paid for the old works.

Legal Intelligence.

THE ALNWICK GAS WORKS POOR-RATE ASSESSMENT.

The appeal of the Alnwick Gas Light Company, after having been twice respited, was heard before the Easter quarter sessions for the county of Northumberland, held at Morpeth, on Thursday and Friday, the 6th and 7th of April last, Sir WALTER BUCHANAN RIDDELL, Bart., chairman. Mr. P. SELBY and Mr. DAVISON (Mr. SELBY, solicitor) appeared for the appellants; and Mr. HEATH and the Hon. A. LIDDELL (Mr. DIXON being solicitor), for the respondents.

Mr. SELBY stated the case, observing that it was one in which his clients, he was convinced, would be found to have substantial grounds of appeal. The Alnwick Gas Works had, for many years, been rated upon £18. This value had been raised, not long ago, to £25. But in October last the overseers of the parish of Alnwick thought fit to increase their estimate of the rateable value of these works to the exorbitant sum of £225. He (Mr. Selby) would call gentlemen before them conversant with the management and rating of gas works, and also with the manner in which establishments of this nature were valued in regard to their rateable value. For the purpose of arriving at this, there are three methods that may be followed. First, by taking an average of the profits of the company, and by deducting from them the interest upon a tenant's capital—supposing in this case the works let to a qualified tenant—and also deducting his profits upon his capital as a remuneration for his services, and the remainder would give the gross estimated rental. Then, by making an allowance for insurance and repairs, there would be left the net rateable value of the works. Another method is to take the entire quantity of coal consumed in the manufacturing of gas, and, calculating that each ton would produce, say, 9000 cubic feet of gas, we should have the entire quantity of gas made; then, by deducting so much per cent. for leakage, and taking the remainder at the proper price, we shall have the entire income from gas, which in this case will be found to be a little over £700; then, on deducting the cost of production, and making the usual allowances, we shall again have the net rateable value. The third method consists in taking the value of the works as they stand, and putting upon that 3 per cent. for the gross rental and 2½ for the net rental, and it will be found that this result varies but in a trifling degree from the result of the other two methods. The Alnwick Gas Light Company did not shrink from bearing their due share of the parochial burdens, but they were under the necessity of resisting the extravagant demands of the overseers. He would now call his witnesses.

Mr. *William Clazy*: I am manager of the Kelso Gas Works, and have been in the habit of valuing gas works. Have calculated the value of the Alnwick Gas Works in three different ways. First, by taking the average of the profits for the last three years, they are £283, and allowing 5 per cent. upon a tenant's capital of £530, and 35 per cent. as tenant's profits upon the same capital, with an allowance of £20 for management, the result of this is £91 for gross rental; and then, on deducting for insurance £1. 12s., and 2 per cent. for depreciation upon £1760, the net rental will be found to be £54. 4s. Secondly, by taking the entire quantity of coal, and allowing that each ton produced 9000 cubic feet, he found that the entire quantity produced, after allowing 10 per cent. for leakage, was 2,144,000 cubic feet, which quantity, at 6s. 9d. per 1000 feet, gave £723. 12s. The cost of producing this, £419. 17s. 4d., to which have to be added interest and tenants' profits, as before, making a total of £631. 17s. 4d. to be deducted; and in this way the gross rental is £91. 14s. 8d., from which deducting the usual sum for insurance and repairs, the result is similar to the last. Taking the third method, he had valued the works, pipes, &c., and found them worth £2100, and by charging upon this for the gross rental 3 per cent., and 2½ per cent. for the net rental, he found the former to be £63, and the latter to be £52. 10s.

Mr. *William Wilson*: Is manager of the Morpeth Gas Works; has been so since May, 1836. Has valued the Alnwick Gas Works, and considers their net rateable value to be £54. Has valued them in three different ways, which he describes. Has paid much attention to gas affairs. Considers 3 per cent. upon the value of the works a fair method of coming to the gross rental, and 2½ upon the same a proper process to arrive at the net rental. It is the manner adopted in coming to that result by general consent throughout England. The profits allowed on gas works are greater that this. People venturing their money in the erection of gas works are entitled by act of Parliament to 10 per cent. per annum, and to a surplus fund equal to the sixth part of their capital. There is great danger, and often much loss, in gas works. No insurance office will insure gas works. The Alnwick Gas Works have been carried on by this company during thirty years, and out of these thirty years there have been ten years in which they have had no profits—no dividends.

Mr. *James Paterson*, manager of the Berwick Gas Works, gave similar evidence.

Mr. *James Bowmaker*, manager of the Alnwick Gas Works, gave evidence respecting the income and expenditure of the company, and stated that their dividends had not exceeded 7½ per cent. from the commencement, while, instead of having any surplus fund, they had been obliged to borrow £300.

Mr. HEATH then made an able statement on the part of the overseers. He called no witnesses, but contented himself with a searching examination of the evidence given by the witnesses for the appellants.

The CHAIRMAN announced that the decision of the bench was that the gross value should stand at £90, and the net rateable value at £75.

Miscellaneous News.

DR. LETHEBY'S NINTH REPORT ON THE GAS SUPPLIED IN THE CITY OF LONDON.

TO THE HON. THE COMMISSIONERS OF SEWERS OF THE CITY OF LONDON.

Gentlemen,—In accordance with a request made to me, through Mr. Daw, in the month of February last, I have made an examination of the illuminating power and chemical quality of the gas supplied to the City of London by the different gas companies of this metropolis: those companies are the Great Central, which supplies the whole of the City; the Chartered, of Brick-lane and the Curtain-road, which distributes gas to that part of the City which is north of Leadenhall-street, Cornhill, and Cheapside; the City Company, which supplies the district south of those streets, as well as that part of the City which is west of the General Post-office; the Commercial Company, which furnishes gas to a few streets in the neighbourhood of Aldgate;

and lastly, the City Company, which sends cannel gas to the *Times* Office and General Post-office. The following is my report thereon:—

1. *As regards the Illuminating Power.*—This has been tested in the usual manner; namely, with an argand burner of 15 holes and a 7-inch chimney, consuming 5 cubic feet an hour—except in the case of the City cannel gas, where it was found necessary to burn it at the rate of 4 cubic feet an hour; the candle was a sperm candle of six to the pound, burning at the rate of 134 grains per hour, but calculated into the standard value of 120 grains per hour, and thence into its value in wax—the basis of the calculation being, that 13·8 sperm of 120 grains' consumption are equal to 15·8 wax of the like standard value. The photometer was, as usual, enclosed in a dark chamber, so as to exclude, as far as possible, all light but that emitted in a direct line from the illuminating agents. But notwithstanding this precaution, and others which I have been obliged to adopt, the results which I am about to mention are, except in the case of the Great Central and Chartered of Brick-lane, a little over their true value; and this has arisen from the difficulties which I have had to contend with, in rooms not properly fitted up for such experiments, in excluding a certain amount of diffused and reflected light.

In the following table the companies are arranged in the order of their value:—

The City cannel gas	equal to	13·7	sperm, or	15·6 wax.
The City gas	,,	13·5	,,	15·5 ,,
The Great Central	,,	13·0	,,	14·9 ,,
The Chartered of Curtain-road	,,	12·9	,,	14·7 ,,
The Commercial	,,	12·5	,,	14·4 ,,
The Chartered of Brick-lane	,,	12·2	,,	13·9 ,,

From this it will be seen that the illuminating power of the Great Central gas has been about 24 per cent. greater than is required by the act of Parliament.

Another point to which I have directed attention is the *pressure* at which gas is delivered to the public by the different companies. This is of importance, because, when the pressure is low, the street lights, and even the lights of our houses, are insufficient for the purposes required. I do not think that gas ought ever to be delivered at less than an inch of water pressure; and the pressure should be as uniform as possible. The following are the results obtained upon this point:—

	Least Pressure observed.	Greatest Pressure observed.	Average Pressure of the Quarter.
	Inches of water.	In. of water.	In. of water.
City Company	1·5	2·2	1·8
Great Central	1·0	1·8	1·3
Commercial	·8	1·1	·9
Chartered, Brick-lane	·6	1·2	·8
Chartered, Curtain-road	·4	1·0	·7
Cannel gas, after passing through Leslie's governor, &c.	·2	·4	·3

From this it will be seen that the Chartered Company not only furnishes gas at a rather low pressure, but the variation between the extremes is so great that the public must suffer inconvenience from it. Both of the preceding tables have been calculated from about 160 observations.

2. *In respect of Purity.*—Ammonia and tarry matter have been present in the gas in every instance, although the proportions of these impurities have not been the same in each case. This will be manifest from what follows. And here I ought to state that, although the results may not represent the exact proportions of ammonia contained in each of the companies' gas, yet, as they were all obtained in a similar manner, namely, by passing the gas through a stratum of flints, moistened with dilute hydro-chloric acid, then evaporating and distilling with potash to obtain the ammonia in a free state, they represent the relative proportions of this alkaline impurity.

The Great Central contained in 100 cubic feet	·5	grains of ammonia.
Cannel gas, after passing Leslie's purifier	·6	,,
Ditto, before	1·0	,,
Commercial gas	·8	,,
City	·9	,,
Chartered, Brick-lane	1·8	,,
Chartered, Curtain-road	3·8	,,

I place before you a specimen of the ammonia obtained in this manner, and I also exhibit specimens of the fetid tarry matter which that ammonia held in suspension in the gas.

In a former report I alluded to the mischief that results from the presence of these impurities in coal gas; and I now submit to your notice examples of the injury done to copper and brass fittings by the ammonia, and a specimen of the soil of this metropolis infected by the tar. It has been thought by some persons who are unacquainted with the action of poisons on the living system, that, because tar happens to have the power of checking putrefaction and fermentation, it cannot exert any injurious action on the living body; but it might, were it necessary, be easily shown that the two effects are perfectly distinct—the one being an action on dead matter, and the other on living; besides which, it is known to all toxicologists, that the most powerful antiseptics are the most powerful poisons; in addition to which I may state that my own experience and practice have taught me that the fetid effluvium from soil impregnated with gas tar is highly injurious to health. I have known cases where the strongest individuals have been seriously affected by it.

The other impurity contained in coal gas is bi-sulphuret of carbon. This, in the act of burning, becomes converted into sulphurous acid, the acid of the burning match, and then by further oxidation it is transformed into sulphuric acid.

According to Mr. Lewis Thompson, bi-sulphuret of carbon is a constant ingredient of coal gas, which, he says, "seldom contains less than a 1000th part of its bulk." If this were true, as much as 2977 grains, or nearly one-third of a pound, of anhydrous sulphuric acid would be produced by the combustion of 1000 cubic feet of the gas. My own experiments, however, have not furnished me with anything like so enormous a result; and, although they are amply sufficient to illustrate the pernicious effects of such a powerfully corrosive agent, yet they do not, on the average, give me much more than a 20th part of Mr. Thompson's frightful amount. In fact, the largest proportion of sulphuric acid that I have ever obtained from coal gas has not reached higher than 212 grains per 1000 cubic feet; and, taking the average of 46 experiments made during the last year on the gas furnished by two of the City companies, it amounted to just 142 grains per 1000; this, however, is quite sufficient to be the source of incalculable mischief.

The gas supplied to the City during the last quarter has, on an average of nearly 100 experiments, given the following results:—

Proportions of Anhydrous Sulphuric Acid yielded by 100 *cubic feet of each of the Companies' Gas.*

City cannel, before passing Leslie's purifier	8·7	grains.
City cannel, after do.	8·7	,,
Chartered gas, Curtain-road	11·8	,,
Great Central	12·4	,,
City Company	13·1	,,
Chartered gas, Brick-lane	13·6	,,
Commercial	13·9	,,

I have noticed that the proportion of sulphur contained in gas is liable to great variation, and that the amount of acid yielded by it ranges from 6 grains to 21 per 100 cubic feet; this shows that if there is not a means of preventing its presence altogether—a supposition that I do not for a moment entertain—there is at any rate a means of keeping it down to half its present amount.

I have already stated in a former report that most of the sulphuric acid thus generated escapes into the atmosphere in the form of oil of vitriol, the proportion of which, as compared with the amount of anhydrous acid originally produced, is about one-fourth part more. The truthfulness of this statement has been publicly denied; and it has been asserted that the ammonia of the gas always neutralises the corrosive power of the acid thus formed. A little attention to figures, however, will show that the proportion of ammonia contained in coal gas is not half enough to saturate the amount of acid produced; and, even if this were so, ammonia is so unstable a compound that it cannot resist the decomposing power of the burning gas, and cannot, therefore, be present to neutralise the acid; this fact is so well known to chemists that it is hardly necessary to say a single word in proof of it. I have, however, during the last twelve months, made such experiments as convince me that the fact is well founded, and that the greater part of the sulphur contained in coal gas escapes into the air, not as sulphate of ammonia, but as corrosive vitriolic acid; this is proved by the illustrations on the table before you. In bottles Nos. 1 and 2, you will find concentrated solutions of oil of vitriol; those solutions have been produced by the combustion of less than 500 feet of coal gas. In one case the gas was burnt under a platinum rosette, and in the other it was burnt in exactly the same way as the public consume it. In both cases the results are the same, namely, water and vitriolic acid. To prove that these liquids are highly corrosive, and, therefore, destructive to property, I have submitted various tissues, as of leather, paper, linen, and cotton, to their action; and, as you will perceive, the tissues of those fabrics are completely rotted. I place before you examples of the effects produced by liquids derived in this manner from each of the companies' gas. It may, perhaps, be said that these experiments do not fairly represent the actual condition of things when gas is burnt by the public; to this I reply that I have done nothing to exaggerate the results; I have simply burnt the gas at the rate of half a cubic foot an hour from a Leslie's burner, and have collected the products in a clean glass vessel; but, to do away with all objection upon this score, I have obtained from Mr. Spencer Hall, of the Athenæum Club-house, a sample of the water actually produced by the combustion of the gas in the hall of that establishment, and condensed in the cistern of the ventilating pipe, which was designed by Professor Faraday some years ago. This water I also place before you; and you will notice that it is so charged with copper that it has a deep bluish-green colour. I find on analysis that it contains about an ounce and a quarter of sulphate of copper in the pint; this has been derived from the sulphuric acid of the gas and the copper of the ventilating tube. Indeed, the acid must have been in a free or corrosive state, or it would not have attacked the metal in the way in which it has. Mr. Spencer Hall has likewise given me a portion of the deposit found in the ventilating chamber of the library; and here, again, you will notice that the deposit is composed of sulphuric acid and copper. Two similar specimens have also been furnished to me by Mr. Faraday of Wardour-street, and these I have placed on the table for your inspection. Again, I am informed by Mr. Thornhill, of the Literary and Philosophical Society of Newcastle-upon-Tyne, that in the library of that institution, where they have fitted up four ventilators over the chandeliers of the room, as much as half a gallon of water is collected of a night from the gas which is burnt there; this water is so corrosive from the presence of sulphuric acid that it attacks all the metal fittings with which it comes into contact, and thereby acquires a metallic impregnation of copper and iron. I have analysed the various specimens of these liquids and deposits, but do not find that they contain more than a mere trace of ammonia. This demonstrates beyond all doubt that sulphuric acid is produced by the combustion of the gas, and that little or no ammonia escapes to neutralise it.

I proceed now to examine the question, as to the effects of this destructive compound on various articles of furniture, &c. The specimens of leather, paper, cotton, and linen, now upon the table, will prove to you that the corrosive power of the acid is very considerable; in addition to these, I have obtained a few facts which are of public interest.

Through the kindness of the managers of the Athenæum Club-house, I have had access to the various documents which they possess, on the subject of the injury done to the library of that institution by the products of burnt gas; and I find that in the summer of 1842, a committee was appointed to investigate this subject, and that the services of Professors Faraday and Brande, Mr. Aikin, Mr. Brown, and Dr. Prout, were enlisted. Without going into the detail of their investigations, which went to show that oil of vitriol was the great cause of the mischief, I will inform you of the result at which they arrived. Dr. Prout said that he had taken two equal portions of the water used in the house, and had exposed one of these for a fortnight to the air of the drawing-room of the establishment; by which means he found that it thereby acquired a striking increase of sulphuric acid, so that when it was evaporated nearly to dryness it distinctly reddened litmus paper, and showed the presence, of free sulphuric acid. "This," said Dr. Prout, "sufficiently explains the destruction of the books, nor will there be any improvement till the gas is either removed or its fumes conducted away by appropriate chimneys." Mr. Faraday and Mr. Aikin agreed in this opinion; and the committee resolved that, as from the above experiment it appeared that much of the injury suffered by the books in the library is owing to acid vapours evolved by the combustion of the gas, it is advisable that, for the preservation of the library, the gas should either be discontinued, or that some arrangement be adopted for carrying off the fumes, by an improved system of ventilation. In the end the latter was adopted at the suggestion of Professor Faraday, and, although the mischief has been to a great extent abated, yet I am informed by Sir Henry Ellis, that he thinks he sees a certain degree of injury still progressing. Through the kindness of Mr. Magrath, the secretary of the club, and Mr. Spencer Hall, the librarian, I am enabled to show you numerous specimens of the covers of books which have been thus injured; and you will notice that wherever they have been exposed to the atmosphere containing the vapours of burnt gas, they are as rotten as tinder; indeed, it often happens that the covers give way in attempting to remove the book from its place on the shelf.

At the London Institution, in Moorfields, the books have suffered in a similar way; and Mr. Brayley, the librarian, tells me that the books situated in the upper part of the room suffer most. He noticed that the surface of the leather of the binding lost its smoothness, and eventually the whole was reduced to a brittle substance, composed of a scarcely coherent powder, which had a powerful acid taste; to this he adds, that evidence has been obtained from bookbinders, as well as booksellers, of the deleterious action of gas lights and gas stoves on the bindings of books. In consequence of this a ventilating apparatus has been put up in the library of the institution.

Mr. Spencer Hall informs me that almost the entire library of the Earl of Tyrconnel, at Kilpin, in Yorkshire, whose mansion is lighted with gas, has been destroyed in a similar way; and Mr. Brayley confirms this fact. The latter gentleman has also told me that mischief of a like description has occurred in the Portico Library, at Manchester; and, from a statement made in a leading article of the *Times* of the 14th of January last, it appears that the books in one of the rooms of the *Times* Office, where gas is constantly burnt, shrivel up and break after two or three years' exposure.

Within the last day or two I have visited the library of the Royal College of Surgeons, in Lincoln's-inn-fields; and, although gas is not regularly burnt therein, yet it is surprising to see how much mischief has been done to the bindings of the books by the products of gas combustion. I should think that in the gallery of that institution there are hundreds, if not thousands, of books, the backs of which are completely rotten; and Mr. Stone, the late librarian, tells me that he has the most satisfactory proof of its being due to the action of gas, in the circumstance that whenever a book has been taken out of the library for any length of time it is found to be preserved, although its fellow volumes are thoroughly rotted. I place before you a few examples of the injury done to the books of that establishment.

Mr. Thornhill, the librarian of the Literary and Philosophical Society of Newcastle-upon-Tyne, has written to me to say that an enormous amount of mischief has been done to the books of that institution, "It may," he says, "be stated generally that all the books which have been in the library for a few years have suffered more or less from exposure to the action of the matters thrown off from the gas, and that large sums have been expended in bookbinders' bills, and will yet have to be expended before the mischief is repaired." The nature of the mischief, he says, is in the entire destruction of the texture of the leather, and even of the ends of the books; and, as might be expected, the books in the upper part of the room have suffered most. "In a room where books of reference such as encyclopædias, dictionaries, &c., are kept, and which is used also as a reading-room, the quantity of gas burnt is large in proportion to the size of the room; in most cases the leather on the backs of the books in this room has been frequently renewed, both in cases in which the books were frequently used, and in which they were not used at all; the backs, in fact, became loose as the books stood upon the shelves."

And now comes a very instructive observation which has been communicated to me by Mr. Thornhill. "In the case of books missing from the library being recovered, the leather of the books so restored has been found perfectly good, whilst the leather on the books in the same binding has been utterly destroyed, although the books had been standing almost undisturbed (excepting for being dusted) on the shelves; one book was recovered after having been out of the library ever since the year 1818—it had, in fact, been replaced; it is bound in an inferior russia, which is perfectly sound and good. In a set of 'Dodsley's Annual Register,' bound in the same leather, and purchased a few years ago in first-rate condition, the leather could be easily brushed off by a hard brush."

It might be thought that the mischief here alluded to arises from other causes than the combustion of gas; but the proofs of its action are so clear that it is not necessary to discuss this point; indeed, I have ascertained by actual analysis that the leather on the sides of the damaged books is uninjured, while that on the back is completely rotten: this is dependent on the circumstance that the atmosphere is excluded from the sides by reason of their pressure against the neighbouring books, whilst the back is freely exposed to its influence.

Other tissues besides leather are acted on in the same manner. I have put on the table a specimen of gutta percha that has been completely destroyed by exposure to the heat and acids of gas as it lay in a shop window. Dr. Prout long since showed that all the furniture of the Athenæum Club-house was damaged by the same agents; and it is not possible to examine a single fabric in London, without finding it charged with a greater or less proportion of sulphuric acid. Dr. Christison, of the University of Edinburgh—the well-known author of our best English treatise on poisons—informs me that the gas in Edinburgh kills all the plants in the rooms of that city. "Even a bouquet," he says, "undergoes rapid withering, if shut up in a room for some hours, where gas is burning freely. I have observed this sometimes under my own nose in the summer, when, in the evening, the door of my room has been a little open." In addition to this, he states that the curtains in the upper part of the rooms are apt to go, and that the silver of the jewellers' shops is quickly tarnished by it.

It may now be asked whether I can suggest any remedy for the evil. I reply that the remedy is threefold:—1. In respect of the manufacture of gas; 2. As regards its purification; and 3. In a more perfect system of ventilation.

1. At present, gas is manufactured from materials which are known to contain a large per centage of bi-sulphuret of iron; and the temperature at which the gas is made is far too high for sanitary purposes.

2. Although much attention has been directed to the purification of gas from one or two of its impurities, little or no notice has hitherto been taken of the most important of all, namely, bi-sulphuret of carbon.

3. It is advisable that gas should be burnt outside the room or shop whenever it is practicable; and when this is not the case, the products of the combustion should be conveyed away by a special contrivance as speedily as possible; indeed, they ought not to be allowed to escape into the room at all.

I am quite sure that many elegant arrangements may be suggested for this purpose, whenever the public are made aware of its importance.

I have the honour to remain, your obedient servant,

HY. LETHEBY, M.B.,

Professor of Chemistry and Toxicology in the London Hospital.

London Hospital, May 8, 1854.

EQUITABLE GAS LIGHT COMPANY.

An Ordinary Meeting of the Shareholders in this Company was held on Tuesday, May 23, 1854—Lieutenant-Colonel HENDERSON in the chair.

The report of the board of directors, and the accounts, were read:

"In submitting for your information the results of the company's proceedings during the half-year ending the 31st of December last, your directors have the satisfaction of congratulating you upon a continued increase in the consumption of gas, and likewise in the net profit, as compared with the corresponding period of the former year. This progressive state is the more gratifying when the period referred to in the accounts now before you is reviewed, it being one of more than ordinary difficulty for all gas companies. But your directors have the pleasure of stating that, as their contracts for coals were for delivery alongside of the works, the extraordinary high rate of freights which prevailed during nearly the whole term now under consideration, did not materially affect the profits of the half-year.

"To supply the increasing quantity of gas during the last winter was a source of anxiety to the board, in consequence of the limited stowage for gas at your works. Arrangements have consequently been entered into for increasing three gasholders, by which will be gained an increased capacity for about 100,000 cubic feet of gas, at a cost of about £2000. But your directors think it right to inform you that, if the increase in the demand for gas continues in the same ratio as for the last two or three years, it will be expedient to determine on constructing a new gasholder of larger dimensions, the estimated cost for which is from £10,000 to £12,000.

"Your directors desire to remind you that debenture bonds fall due during this year amounting to £8100, £1500 of which have already been paid off; and £6600 fall due in November next, which they recommend should be renewed.

"The increase in the price of coal, iron, bricks, timber, labour, and every material connected with the manufacture of gas and maintaining the works, rendered it indispensable to increase the charge for gas at Christmas last to 4s. 6d. per 1000 to those consumers who, up to that period, had paid 4s.; and it is satisfactory to state that this alteration has been carried into effect without meeting with any objection on the part of the consumers, it being generally known that this small increase bears no proportion to the advance in the prices of the materials above referred to.

"Your directors have to inform you of the second reading of a bill for the construction of a railway from Westminster to Clapham, to be called the Westminster Terminus Railway, which is proposed to go over the company's wharf at Thames-bank. The board having appointed a committee to watch the progress of the bill, and to protect your interest, that committee have called to their aid an experienced engineer, with whom they are co-operating and devising plans to meet the emergency of the case.

"The accounts, which have been examined and certified by the auditors, are now on the table. They exhibit a manufacturing profit of £7092. 2s. 2d., which is chargeable with the sum of £1141. 9s. 3d., for interest due on the borrowed capital of the company; of £411. 11s. 9d. written off as bad debts, and other deductions of minor importance—leaving the amount of £5480. 14s. 5d. as the net profit on the last half-year's operations; from which your directors recommend that a dividend shall be now declared of 15s. per share, clear of the income tax, that being an increase at the rate of from 2½ to 3 per cent. per annum upon the capital of the company; leaving a balance of £2480. 14s. 5d., which they recommend shall be carried to the credit of the suspended account, as heretofore; of which sum £1500 have been appropriated to the payment of debentures due on the 13th instant.

"Your directors have further to report that, in pursuance of the pro-

visions of the company's act of incorporation, two directors and one auditor will go out of office at this meeting; and the directors and auditor who are to retire are, Philip Van de Wall and George Henry Pinckard, Esqrs., directors, and George Dyer, Esq., auditor, all of whom are eligible to be re-elected, and offer themselves accordingly.

"The board have great pleasure in drawing the attention of the meeting to the valuable services of the secretary, who has now been four years in the employment of the company, and they recommend that his salary should be increased, the amount of which increase is for the consideration of the shareholders present at this general meeting."

EQUITABLE GAS LIGHT COMPANY.

Dr. MANUFACTORY ACCOUNT, from July 1 to Dec. 31, 1853. *Cr.*

To tradesmen's accounts, for lime, &c.	£ 168	15	4	By gas rental, half year to Dec. 31, 1853	£19,201	2	1
To coals, consumed	9,847	17	2	By coke account, proceeds of sales and stock	5,154	19	8
To wages, paid under this head	2,469	14	6	By tar, do. do.	55	0	7
To rent and taxes, paid and due	349	11	8	By ammoniacal liquor do. do.	148	7	6
To directors, paid	300	6	0	By discount and allowances on tradesmen's accounts.	16	14	8
To auditors, due	30	0	0	By the Chartered Gas Company, do.	26	10	2
To salaries, paid	842	2	8	By the London Gas Company, for gas supplied them*	334	9	3
To collectors' commission, paid and due	201	16	2				
To stationery, stamps, &c., do.	51	11	0				
To general charges, paid	123	12	8				
To gas allowance, amount written off	127	6	7				
To wear and tear, amount of account	3,330	15	3				
To gas rental, for amount returned, Ferrier	1	12	9				
To profit and loss, for half year's working profit	7,092	2	2				
	£24,937	3	11		£24,937	3	11

* Including £320 paid into court by the London Gas Company, on account of claim for gas supplied off the Equitable Company's mains.

Dr. PROFIT AND LOSS ACCOUNT, from July 1 to Dec. 31, 1853. *Cr.*

To dividends, for 20th div. under act of incorporation.	£2,500	0	0	By balance of unappropriated profits	£5,518	14	0
To interest, amount of account for half-year to Dec. 31	1,141	9	3	By cash, for bad debts recovered	41	14	8
To bad debts, amount written off to Dec. 31	*411	11	9	By outstanding accounts, amount received on bad debts	0	11	5
To general law charges, amount of account	2	4	9				
To income and property tax, amount reserved	98	8	1				
To suspended account, per resolution of general meeting	3,018	14	0	By manufactory account, half-year's working profit to Dec. 31	7,092	2	2
To balance, half-year's net profit	5,480	14	5				
	£12,653	2	3		£12,653	2	3

* Including £179 balance of account due from a public establishment.

Dr. BALANCE SHEET, Dec. 31, 1853. *Cr.*

To investment, amount of account, June 30	£203,037	6	10	By capital joint stock, received of proprietors	£180,722	10	0
To investment, amount charged this half-year	593	1	0	By tradesmen's accounts, due by the company	4,512	4	0
	£203,630	7	10	By taxes, balance due	116	7	10
To gas rental, due to the company	13,775	19	0	By collectors' commission, due	73	17	1
Do. outstanding accounts	362	9	6	By auditors, due	30	0	0
	14,138	8	6	By debentures, balance of amount issued	45,800	0	0
To cash, balance in hand	1,300	14	9	By do. interest, balance to Dec. 31	329	6	9
To tradesmen's accounts, owing for coke, &c.	518	12	4	By gas deposits, due to sundry depositors	146	17	3
To coke and breeze, stock on hand	489	0	1	By dividends, balance due to Dec. 31	478	5	0
To tar, do.	70	14	2	By income and property tax, balance due to Dec. 31.	201	4	6
To ammoniacal liquor, do.	19	15	0	By loan accounts, do. do.	2,517	12	0
To general stores, do.	1,757	5	7	By profit and loss, balance of account, half-year's net profit	5,480	14	5
To coals, do.	1,144	11	0				
To service pipes, do.	199	14	6				
To pipelaying account, do.	440	13	8				
To meters, amount of account	6,470	3	9				
To Chartered Gas Company, balance due	27	19	5				
To London Company, do.	33	12	11				
To suspended account, balance June 30, £13,185 19 4 Less written off 3,018 14 0	10,167	5	4				
	£240,408	18	10		£240,408	18	10

The CHAIRMAN read a resolution of the board, stating that the secretary had been four years in the service of the company, and that an addition to his salary was recommended by them, but that it rested with the meeting to determine the same.

Mr. C. GRAY and Mr. W. PEARSE referred to a sum paid by the London Company, upon which a discussion took place, and the explanations given by the board deemed satisfactory.

Mr. C. GRAY referred to the statement in the report of more gasholder room being required. He (Mr. Gray) did not know what they wanted with more gasholder room, when other companies, much larger than the Equitable, worked with much less.

It here became evident that Mr. Gray did not understand the language of the report on account of deafness. The chairman put him right on the subject, when

Mr. GEDDIE PEARSE hoped that no additional gasholders would be put up without calling in an efficient engineer to report on the same, for he knew well the large sums required to build gasholders, and trusted that no unnecessary outlay would take place, if it could be in any way avoided.

The CHAIRMAN assured Mr. Pearse that every precaution should be taken, but that the works must be carried on efficiently, and that to do so money must be had, either from surplus profits or by borrowing.

Mr. G. PEARSE thought that, after fourteen years' waiting, some addition might be made to the dividend, as enough of surplus profits had been taken to carry on the works.

Mr. BOX entered into a long statement of the accounts—showing the accumulated surplus profits, urging an addition to the dividend, and concluding by expressing his opinion that the accounts were not so explicit as those of the Imperial Company.

The CHAIRMAN: They are upon the same system as the Imperial, having, in fact, been laid down by the accountant of that company.

Mr. BOX would like to see coke and breeze kept separate, and the wear and tear very much less.

Mr. RHODES urged the adoption of clay retorts.

Mr. BOX moved, and Mr. W. PEARSE seconded, "That the dividend be increased to 4 per cent. per annum."

The same was put and lost, when the original motion of 3 per cent., as recommended by the directors, was put to the meeting, and carried.

The ordinary business of the meeting having been concluded, the subject of the secretary's salary was brought forward by the CHAIRMAN, when the secretary retired during the period the same was discussed.

The CHAIRMAN then rose and said that it only remained for him, having already referred to the subject, to read that portion of the directors' report, in which mention had been favourably made by the board of their secretary.

Mr. RHODES, believing that the directors intended that the proposition should emanate from the meeting, proposed that £50 per annum be added to the salary of the secretary.

Mr. HADLAND seconded the motion.

Mr. RHODES would still like an expression from the chair, as to the opinion the directors had of the secretary's capabilities.

The CHAIRMAN, in reply, said, that inasmuch as the board had recommended an increase, and as the appointment rested entirely with the proprietary, he would rather the question be entirely considered by the meeting.

Mr. O. C. LANE suggested that, inasmuch as directors and proprietors must be equally interested in the efficiency of their secretary, but as the directors alone could be the only parties who really knew his capabilities, it was but natural that the directors should be appealed to for information.

The CHAIRMAN then put the motion to the meeting, and the same was carried unanimously.

Mr. BOX wished to say a word or two upon the subject; but, as he had already been beaten upon one amendment, it was not his intention to propose another; but he would express an opinion to this effect, that had the sum been doubled, it would have pleased him better, for he was one of those who deemed the present secretary a very efficient one—one who devoted his entire time and energy to

the company's good; and further, he was of opinion that, unless men of business were paid a fair renumeration for their labours, you ceased to retain them in your service, if an opportunity occurred for them to better themselves; therefore, upon that ground (call it a selfish one if you will), it was far better to be liberal than otherwise; at the same time he was well aware that dividends were not large, and, as such was likely to be the case for the future, perhaps at some no very distant period an additional £50 would be added. He (Mr. Box) considered the present a much better secretary than the last ("Hear, hear," from Mr. Van de Wall), and therefore equally entitled to the same remuneration.

Mr. MARDON inquired what salary the present secretary had?

The CHAIRMAN stated that Mr. Andrews had been with the company four years, and had £300 per annum. His predecessor was eight years in the company, and received £400 per annum.

Mr. LEWIS THOMPSON thought, from the speech of Mr. Box, that he certainly would have concluded by moving an amendment, and he trusted that, as a young proprietor, he should not be deemed intrusive if he offered a few remarks on the subject now under discussion. He had had opportunities of knowing something of Mr. Andrews and his capabilities, and he could assure the meeting that they possessed a very efficient secretary; for he well knew that hours usually devoted to recreation by most other men, were by him given to the company in various ways; and, as an illustration of what he meant by capabilities, he might state that in the house in which they were now met there was in the lower part of it an experimental apparatus, by which the secretary was enabled to ascertain the quality of any coal that might be submitted to him for approval, and thereby placing himself in a very superior position in the purchase of such coal than he would be were he ignorant of its capabilities and quality. He begged, therefore, that the meeting would take a liberal view of the services rendered to the company, knowing, as he well did, that unless officers of merit were encouraged by a liberal feeling on the part of those they served, their interests were not attended to with that efficiency which, after all, was the only sure means of success. He (Mr. Thompson) could mention a company—a young and struggling one—who gave their secretary £500 per annum, and did not at all think that it was a large salary.

Mr. HADLAND: Perhaps, as the dividends were progressive, the salary of their secretary might also be progressive. He might observe, that great sacrifices had been made by the proprietors for years; and, although willing to be liberal, at some future time an addition could be made to the sum now voted.

No further remarks having fallen from the meeting, the secretary's presence was then requested; when

The CHAIRMAN said, on the secretary taking his seat, that he (the chairman) had the pleasing duty to inform him that the meeting had voted an addition of £50 per annum to his salary; when

The SECRETARY rose and spoke as follows: However much gratified he might feel at any expression of commendation emanating from the proprietors, he could not disguise from himself the fact that justice had not been done him; and, although at all times diffident in speaking of himself, yet he had thought that the time had now arrived when he might have expected a different result. Not that the decision at which the meeting had arrived would in the least alter his feelings towards the interests of the company intrusted to his keeping, or in any way damp that ardour for its well-doing that he ever endeavoured to manifest; but he must, he felt that he could not do otherwise, in justice to himself and the position that he occupied, painful as the act was, respectfully, but at the same time firmly, decline the amount awarded him. In taking this step he trusted the proprietors would, he begged of them, believe that the same spirit of good feeling which had hitherto actuated him in the discharge of his duty would be continued; for with him it had ever been, and ever would be, to do it well: but as his position was in his own keeping, the course that he had taken, he felt assured, would be approved of by his family and friends; for unless he could, by an act of the shareholders, be placed in a similar position to that of his predecessor, he would much rather remain as he was, unshackled in his future actions. He would further express, that gentlemen holding similar positions to himself met invariably with different reward; and as the board had taken the step without any interference on his part, he had expected that the result would have proved more in accordance with his feelings, and the position that he occupied. He would, in conclusion, repeat his sincere expressions of thanks for the kindness shown him by the meeting, assuring them, as he then did, that so long as he remained in the service of the company, so long should its interests receive his best and closest attention.

Mr. BOX expressed regret at the decision arrived at by the secretary, but trusted that he would reconsider it, inasmuch as the dividends were not large; and at a future period an additional £50 would be added. He (Mr. Box) felt, that when the secretary consulted the board on the subject, that that would be his feeling.

Mr. PEARSE moved, and Mr. MARDON seconded, that the thanks of this meeting be given to the chairman and directors for their services. The same was put, and carried unanimously.

The meeting then separated.

THE SUPPLY OF GAS IN MARYLEBONE.

REPORT OF THE COMMITTEE OF VESTRY ON THE LIGHTING OF THE PARISH.

The Vestry of St. Marylebone held a meeting on Saturday, the 13th of May, at the Marylebone Court-house, for the purpose, amongst other matters connected with the local management of that great district of the metropolis, of considering the report of a committee appointed to consider a charge made against the Imperial Gas Company, of giving a large deficiency of the gas for which they had contracted with the parish to supply the public lights.

These charges had been made at a previous meeting by a ratepayer named M'Dowall, who also stated that he was prepared to prove, if the vestry granted a committee, that not only was the amount of gas supplied very deficient in the quantity contracted and paid for by the parish, but that the gas itself was of a very inferior quality.

CLEMENT GEORGE, Esq., the newly elected churchwarden, having been called to the chair,

Mr. W. E. GREENWELL, the vestry clerk, brought up and read the report of the committee, which was as follows:—

"*St. Marylebone, May* 4, 1854.

"At a meeting of the committee to consider the charge of deficiency of supply of gas to the public lamps—(present, Mr. Hodges in the chair, Mr. Burden, Mr. Powell, Mr. Wingfield, Mr. Tarlington, and Mr. Soden)—your committee report, that they have held two meetings, and at the first meeting, Mr. Henry, the secretary of the Imperial Gas Company, attended with the superintendent, and made the following statement:—

"'That, on complaint being made of the deficiency of light, the superintendent had the following burners tested, viz.:—

No. 1 consuming	5	feet of gas per hour	
2	7¼	"	
3	3¼	"	Norfolk-road; orifice too small.
4	5	"	
5	7¼	"	
6	5½	"	
7	4	"	
8	6	"	

and that the maximum quantity was from 8 to 9 feet per hour.'

"At the second meeting, the following experiments were made by the vestry's surveyor, under the direction of the committee—a new dry gas meter by Defries being used for the occasion:—

"*First Burner.*—A new full-sized batswing.

"1st Experiment.—One foot was consumed in 9½ minutes, being about 6 feet per hour; flame 4 inches wide.

"2nd Experiment.—Flame 2½ inches wide; 1 foot consumed in 15 minutes 10 seconds, being rather less than 4 feet per hour.

"*Second Burner.*—A burner taken from a lamp in Queen Ann-street.

"1st Experiment.—One foot consumed in 17 minutes 15 seconds = 3½ feet per hour, at an angle of 75°.

"2nd Experiment.—The same burner when cleaned, and the cock at 90°; ½ foot consumed in 5 minutes 32 seconds = 5¼ feet per hour.

"3rd Experiment.—The same burner, with the cock at 50°, consumed ¼ foot in 9 minutes 15 seconds = 1¾ foot per hour.

"*Third Burner.*—Taken from a lamp in Allsop-place.

"1st Experiment.—Flame 2½ inches wide, cock at 50°, consumed ¼ foot in 7 minutes = 2¼ feet per hour.

"2nd Experiment.—The same burner, cock at 50°, consumed ¼ foot in 10 minutes = 3 feet per hour.

"Your committee, referring to the contract, find that the Imperial Company engage to supply 4 feet of gas per hour by the batswing burner; and they are of opinion, from the information they have obtained and the experiments made, that the quantity actually consumed is considerably less than that agreed for.

"Your committee are also of opinion that the present system of lighting the lamps of an evening is defective, the burners not being so readily accessible for cleaning or fair adjustment as by the old system.

(Signed) "E. HODGES, Chairman.

J. WINGFIELD.	JOHN BURDEN.
G. TARLINGTON.	FRANCIS CALDER.
JONATHAN SODEN.	THOMAS POWELL."

Mr. SODEN said he would, although a member of the committee, move that this report be recommitted. He thought it was a subject of too much importance to admit of the vestry coming to anything like a party conclusion. He thought, in the first place, that there had not been a sufficient test; and therefore, as a member of the committee, he for one should not feel disposed to vouch for the entire accuracy of the contents of the report, or for the figures which it contained. In a matter of this kind, it was only an act of justice to the Imperial Gas Company as well as to themselves, that conclusions should not be come to without mature deliberation; and he hoped that the vestry would agree with him, not only that this report should be recommitted, but that it should be referred to a committee of the whole board. What they really wanted to get at was, about the average light received by all the public lights throughout the parish, and not that they should have before them a few isolated instances. What he thought they wanted, in the first place, to ascertain, was the actual extent of flame which would produce four feet of gas per hour, which was the amount of gas that the Imperial Gas Company had contracted for to supply the public lights of that parish. To his (Mr. Soden's) mind, that point had not been very clearly ascertained up to the present time, and, therefore, he thought it was not right to adopt this report as it then stood. He moved that the report be referred back for the consideration of a committee of the whole board.

Mr. WINGFIELD seconded the resolution to refer the report to a committee of the whole board. The reason he did so was, that he thought there was no chance of carrying the present report in that vestry. Let it, therefore, be referred back to the whole board, to be tested, before a conclusion is come to. He was sure that, if this were done, the statements made in the report would be entirely substantiated.

Mr. WHITMORE said he most cordially supported this motion. He candidly confessed that he did not understand by what proceeding the conclusions of the report had been arrived at. It contained, however, some sweeping charges against the Imperial Gas Company, and he was anxious that such charges should be fully established before they were to be permitted to go forth to the world. It was not, he thought, right that these statements, reflecting upon the character of a great and respectable company like the Imperial Gas Company, should go forth merely upon the statement of five or six gentlemen. If the charges contained in that report were satisfactorily proved, he (Mr. Whitmore) would be the first to denounce the Imperial Gas Company as a body of dishonest men; but he must be satisfied that they were so before he made such a charge. So far as regarded the tests referred to in the report, he thought that those tests had not been fairly applied; for they had heard that Mr. Scace, the parish

surveyor, had selected the very worst burners he could possibly find. Now, in order to apply a fair test, he thought that the burners should be taken indiscriminately from various parts of the parish; for it might so happen that, whilst one burner did not yield the quantum of four feet of gas per hour, another might burn considerably more. Let the vestry have a fair, honourable, and proper test, and then, if it be proved that the parish did not have the gas they paid for, they could not only enforce the penalties against the company for their breaches of contract, but they would, at the same time, be exposed to well-merited opprobrium. (Hear, hear.)

Mr. JACOB BELL did not think that the members of the committee could be very well satisfied with their own report, when they found two of them moving and seconding that it be referred back again. He confessed that he himself was not at all satisfied with the report; and, if it was to be referred back to a committee, he thought the tests which were to be applied, in order to ascertain the quantity as well as the quality of the gas consumed, should be performed, not by the committee themselves, but by some competent scientific gentleman in whom they could place confidence. It would be, no doubt, remembered that, some years ago, there was a similar charge made against the Imperial Gas Company, of not supplying the amount of gas they contracted for, and for which they were paid; and the result was that, he believed, the charge was so far established, that the Imperial Gas Company, in lieu of penalties, presented £500 to the St. Marylebone Almshouses. Let there be a rigid and proper investigation, and, in the event of any defalcation in the proper amount of gas to which the parish was entitled being proved, then it would be the duty of the vestry to enforce the penalties. (Hear.)

Mr. GEORGE BIRD did not understand what the proposal was before the chair.

The CHAIRMAN said the proposal was to refer the report of the gas committee back to a committee of the whole board.

Mr. GEORGE BIRD thought that to refer the report of the committee back to a committee of the whole board, would be useless, as, if Mr. Henry, the secretary of the Imperial Gas Company, got twenty-four hours' notice that the burners were to be tested, it could be easily managed to put on a sufficient supply of gas. So far from the report being an exaggeration, in stating that 2½ inches of flame in some of the burners did not produce 4 feet per hour, and that they did not have anything like the amount of gas for which they paid, he (Mr. G. Bird) was satisfied that there were many lights in that parish which did not burn more than an inch of flame, instead of 2½ inches. If it be the case that burners with a flame of 2½ inches did not consume 4 feet of gas per hour, what must be the loss to the parish where, as he was prepared to assert, there was only 1 inch of flame emitted from the burner? So far from Mr. Scace, the surveyor, making a selection of the worst burners he could find, his (Mr. G. Bird's) opinion was, if he took burners which exhibited 2½ inches of flame, that he had taken the best that could be found in the parish. (No, no.)

Mr. WHITMORE: Ask the surveyor.

Mr. G. BIRD should not think it worth his while to ask Mr. Scace any questions, as he invariably, when he did so, behaved exceedingly rude.

Mr. BRIDGMAN rose to order. He really did not think that their officer (Mr. Scace) could be charged, with justice, of being rude to any one. (Hear, hear.)

Mr. KIRBY must also repudiate the assertion made by Mr. G. Bird. Mr. Scace, as an officer, had a very high reputation, not only for his skill, but for his general urbanity, and he thought there must be some mistake in the matter. (Hear, hear.)

Mr. G. BIRD begged to state that he had, in the performance of his duty as a member of that vestry, put questions to the surveyor in that room, and had been answered very rudely and uncourteously. ("Oh, oh," and cries of "Question.") Well, Mr. Whitmore might be under an impression that Mr. Scace had taken some of the worst burners he could find to place before the committee; but he (Mr. Bird) could not agree that such was the case, when he knew that there were many lights which did not exhibit more than an inch of flame, and which, instead of burning 4 feet, did not consume 2 feet of gas per hour. If the report was not founded on that which was considered as a fair test, he was sure that it was not likely they would have a fair test by giving twenty-four hours' notice to the company that they were going to try experiments for testing whether the parish had its due supply. What he (Mr. G. Bird) should propose was, that they should not give the Imperial Company any notice, but that they should have a test going over for a period of three months, and then they would be likely to arrive at something like a conclusion. So far from the public lights of Marylebone being supplied with 4 feet of gas per hour, he was perfectly satisfied that in many of the large streets of that parish there were gas lights which did not consume 1½ foot of gas per hour. It was a notorious fact that Marylebone was the most miserably lighted parish in London.

Mr. GRANGE certainly thought, in justice to the company, that they should not depend upon a few isolated cases of burners not giving the proper quantity of light. That was a circumstance which might, perhaps, arise from a variety of causes. The test should be a fair and general one in all the districts of the parish. It was certainly only fair that the ratepayers should have the advantage of receiving the amount of light for which they were taxed.

Mr. WINGFIELD wished to correct a supposition that the committee depended entirely upon their own knowledge of gas in coming to their conclusions. He begged to state that they were aided by a person of science who understood the subject. They used one of Defries's dry gas meters, and there was a gentleman present with it, who explained its operations and took the quantities of gas it registered.

Mr. BRIDGMAN said he must repudiate the insinuation, that, in consequence of twenty-four hours' notice being given to Mr. Alexander Henry, the secretary of the Imperial Company, there would not be a fair test of the amount of gas each burner of their public lights consumed. To assume that, because they had notice that the parish were about to make such test, an order would be given to put a high pressure on the gas at the works, was, he thought, a most unfair imputation. He thought that the evidence upon which the report was based, and the experiments which had been represented to have been made, were most unsatisfactory. It had been admitted that seven burners had been selected as the worst burners which could be found; and what was the result of the experiments? Why, although there might be some burners which burnt under three feet of gas per hour, there were some tested by the inspector which consumed upwards of seven feet of gas per hour. It could not be expected that, out of about 3900 burners, they could have them all perfect, and burning all exactly the same quantity of 4 feet per hour; there would, amongst such a quantity of lights, be sure to be discrepancies. As to the experiments, therefore, which had been made upon six or seven burners, he looked upon that as no test at all. He hoped that the course adopted would be, that the vestry would appoint some proper person, for a time, to test the flame, and the quantity of gas consumed, before they allowed a report to go forth to the world indulging in such sweeping charges against a respectable company like the Imperial Gas Company.

Mr. TODD said he had moved for a committee last year upon this subject, in consequence of the shameful state of the lighting of St. John's-wood, where he was perfectly convinced, instead of burning 4 feet of gas per hour, there were not 3 feet per hour consumed. It still continued, and a short time since, in the Grove-end-road and vicinity of the Roman Catholic Chapel, he counted in one night as many as 25 lights out. There were a great many lights continually out in the St. John's-wood district, and he had heard it said that some honourable members of that board had climbed up the lamp-posts and put them in again. (Laughter.) He thought, at all events, that this was a subject which ought not to be passed lightly over. (Hear.)

Mr. NICHOLAY quite agreed with Mr. Todd that it was necessary some steps should be taken on this subject. As to there being so many lights out in the St. John's-wood district, he had understood that there were a great many gentlemen in the habit of climbing up the lamp-posts when they returned home from public dinners; some gentlemen had even been known to have hung articles of clothing on the lamp-posts. (Laughter.) Those circumstances might, perhaps, account for so many lamps going out. He thought there was not so much fault in the burners themselves as there was fault in the managers of the burners, who now, instead of using a ladder, poked the gas on and off with a long pole or stick, and they had not by that means the power of regulating the keys to the proper extent they had when the old system of the ladder was adopted. Mr. Henry had had his attention called to this circumstance, and he (Mr. Nicholay) believed he had promised that the stick-poking system should be altered. He certainly did think that the plan adopted by the committee, of merely picking out a few burners, was not a fair testing of the question of whether they had a proper supply of gas or not.

Mr. BURDEN could say, as one of the committee, without fear of contradiction, that even the circumstance of the appointment of that committee had done good, and that since the report of that committee the public lights had been 20 per cent. better than they were before. A great deal had been said about the burners; but it was not the burners that they had any reason to complain of: it was that the lamplighters had strict orders from the authorities of the company not to turn the lights on to anything like their extent; and that was the cause of there being an improper light. If the report was not adopted by the vestry, at any rate the appointment of the committee had done good. It was not fair to that committee that gentlemen should get up and say that their tests amounted to nothing. He believed that their tests were most fair, and that much good had resulted from it, and that it distinctly proved that the Imperial Company did not give the light for which they contracted, and for which the company were paid. What he thought ought to be done was, that the report should go upon the books, and stand recorded against the Imperial Company as a fact produced against them, whenever there might happen to be a chance in that parish of competition in the article of gas. ("Oh, oh," and "Hear.")

The question was then put from the chair, and the resolution to refer the report back to a committee of the whole board was carried.

The vestry then proceeded to other business.

AMALGAMATION OF THE TWO SUNDERLAND GAS COMPANIES.

An extraordinary Meeting of the Shareholders of the Sunderland Corporation Gas Company was held at the offices of the company, Fawcett-street, for the purpose of authorising the directors to purchase, or of sanctioning and confirming a conditional agreement entered into by the directors for purchasing, the lands, tenements, hereditaments, plant, works, stock, materials, and property of the Sunderland Subscription Gas Light Company, at such price or prices, or at such valuation or valuations, and upon and subject to such terms, conditions, and arrangements generally, as might be agreed upon at such meeting; and, if so decided, of authorising the directors to sign and execute all necessary agreements, conveyances, deeds, instuments, and other acts to carry the same into effect, or in any way relating thereto; and, if so decided, to authorise the directors to issue the whole or any number of the remaining unissued shares authorised to be issued by the Sunderland Gas Amendment Act, 1853, in order to carry such agreement and purchase into effect.

The notice calling the meeting having been read by the secretary, the following resolution was submitted for its adoption:—

"The directors having entered into the following agreement with the directors of the Sunderland Subscription Gas Light Company:—

"That the structural value of the respective works be ascertained by two competent valuers and their umpires, in the usual way; that the entire capital of the Corporation Company shall be converted into paid-up shares, by taking the existing number of issued shares at their nominal value, and

by the redemption of the existing mortgage debt, by calls upon the unpaid-up shares, and by the issue of the necessary number of additional shares; that, as the structural value of the corporation works is to the total number of shares in the Corporation Company, ascertained as above, so shall be the structural value of the Subscription Company's works to the total number of shares to be assigned to the Subscription Company, in consideration of the transfer of their undertaking to the Corporation Company:

"Resolved—That the said agreement be confirmed; that the directors be authorised to sign and execute all necessary agreements, conveyances, deeds, and other acts to carry the same into effect; and that the directors be also authorised to issue the whole or any number of the remaining unissued shares authorised to be issued by the Sunderland Gas Amendment Act, 1853, in order to carry such agreement and purchase into effect."

The CHAIRMAN (Mr. Hewett) said, in rising to move the adoption of the above resolution, it might be necessary to say a few words respecting it. It had generally been found, where there were two companies in a town, that it would tend greatly to the advantage of both the consumers and the companies if they were united together; and the most of those present would, no doubt, be aware that between the two companies in this town there had been considerable negotiations going on for some time back with this end in view. Considerable difficulty, he confessed, stood at one time in the way of such an amalgamation; but he was happy in informing them that had been overcome, and the directors trusted that the method proposed by the resolution just read of bringing the two companies together would be found to be the most just and equitable for all concerned. It might be asked, why should the two companies be connected at all? Just because it had invariably turned out that the works could be carried on at a far less outlay of capital than where the two companies were in opposition. But it might still be asked, suppose a union between the two was of advantage in this respect, why should it take place just now? The answer to that question was this: The old company were at the present time about to extend their works very considerably, and, if the purchase could not be effected now, it could not be on any future occasion without a great addition to the purchase-money. It was to prevent such an unnecessary outlay—disadvantageous alike to the shareholders and the consumer—and because they thought the necessary preliminary arrangements had been duly completed, and every interest properly cared for, that the directors had called the shareholders together to sanction the proceedings of that day. If this course had not been taken, and the additional expenditure of capital, by the extension of their works, been allowed to go on on the part of the old company, and the same feelings of opposition been maintained between the two, he was convinced it would have been productive of great harm to them both. Now, however, the work promised to proceed in a harmonious way. Some years ago, in the heat of their opposition, their shares bore a very different value in the market than they did now. When he came among them, he found the £5 shares hardly saleable at £2. 10s., and he had much pleasure in stating they now readily enough brought £6. 10s.: a state of affairs that the directors did not think would be depressed by joining the two companies together. He might have carried his observations to a much greater length—though probably not with much more advantage to those present—but he would now conclude by stating his readiness to give any shareholder whatever information they might desire concerning the resolution before it was put to the meeting.

Mr. E. C. ROBSON formally seconded the resolution.

Mr. JAMES RICHARDSON thought the resolution was of such a nature that no shareholder could for a moment object to it; for if, as had been ably remarked, the amalgamation had not taken place, the result must of necessity have proved injurious to the shareholders; there would have been a considerable extension of pipeage to pay for, and, as no dividend could be given but out of profits, these profits would have been for some time diminished by this extension of capital. He was one of those individuals that liked to give and take 20s. to the pound; he did not care about going to the Subscription Company, and saying, "I will give you £24,000 or £27,000 for your stock in the gross;" he did not want a fraction belonging to them without paying for it, and the arrangement proposed for making a fair valuation of the works was the justest, as he was sure it would turn out the most advantageous course to both companies. Some individuals in the town professed to look on the amalgamation with great dread, and seemed to think that, unless there was one company lowering the price of gas, and another making it lower still, they could never have it cheap at all; members of the corporation had talked this way, and seemed to have such a feeling for the ratepayers that they had none for the shareholders; but he entertained no such anticipations. When their present excellent chairman came among them their shares, as had been remarked, were only bringing £2. 10s.; and if they were now at £6. 10s., with selling gas at 3s. per 1000, there need be no apprehension that when the companies were united gas would go up to 5s. He had too much confidence in the financial skill of the directors for supposing that would take place. Large profits were not made by selling at a high figure, but by increasing the consumption—something in the manner of the Manchester merchants, who sold out at profit from 2 to 2½ per cent., but who yet, by the largeness of their transactions, cleared their £20,000 and £30,000 a year. Mr. Richardson concluded by bearing his testimony to the able manner in which the affairs of the company were managed, and stating that the resolution now before the meeting had his most entire concurrence.

The resolution was now put to the meeting, and carried without a dissentient vote.

The CHAIRMAN then rose and said it was highly gratifying to the board of directors that the proposed amalgamation had met with the entire concurrence of the shareholders, and he trusted when the two companies were joined together that the same response would be made to their exertions. He must now state to them that it was, perhaps, the greatest pleasure he could enjoy to think he had been spared to witness the time, and to aid in some degree in bringing it about, when all prejudice and party feeling was laid aside on the part of the two companies, and a measure adopted that he was convinced would be for the benefit of both. Every individual who invested capital in undertakings such as the present expected, of course, a rea-onable return for that capital, and he trusted that, in the amalgamation about to take place, that expectation would not be disappointed. At the same time he felt assured the board would use with moderation the power they possessed, and would look well to the interest of the consumers, whose interest was in so many respects identical with their own.

The business for which the meeting was called being now transacted,

Mr. BURNETT, bookseller, moved a vote of thanks to the chairman.

Mr. MAKEPIECE, in seconding this resolution, complimented the directors on their management, as the shares he first held were purchased at £2. 15s., and could now be sold at £6. 10s.; this change in the value of their shares he considered was greatly owing to the careful manner in which the dividends were at first allotted, and the anxiety manifested to add as much of their profits as possible to the capital account of the company—a mode of transacting business which tended ultimately to enhance the value of the shares and consolidate the business of the company.

The vote of thanks to the chairman having been carried with acclamation, the meeting seperated.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast Iron Gas Pipes, per Yard.

1½ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorksh., Derbysh. and Staffrdsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1.	5 5 0	4 10 0	4 10 0	4 15 0	5 0 0
1½ and 2 inches Socket Pipes	9 2 6	8 5 0	8 5 0	8 10 0	8 10 0
2½ and 3 do. do.	8 17 6	8 0 0	8 0 0	8 5 0	8 5 0
4 and 5 do. do.	8 12 6	7 15 0	7 15 0	8 0 0	8 0 0
6 inches and upwards do.	8 7 6	7 10 0	7 10 0	7 15 0	7 15 0
Extra for bends, branches, and connection	2 10 0	2 10 0	2 10 0	2 10 0	2 10 0
Retorts, 2nd fusion, hot blast	8 5 0	7 7 6	7 7 6	7 12 6	7 12 6
Do. 2nd fusion, cold blast	8 15 0	..	7 17 6	8 2 6	8 2 6
Tank Plates, ¼ thick and above	8 10 0	7 12 6	7 12 6	7 17 6	7 17 6
Do. less than ¼	9 0 0	8 0 0	8 0 0	8 5 0	8 5 0
Plain Castings ex. models	8 15 0	7 17 6	7 17 6	8 2 6	8 2 6

COALS.

NEWCASTLE.	s.	d.	
Unscreened.	7	6	per ton.
Whitwell Primrose			
Dean's Primrose	8	0	,,
Pelton			
Brancepeth			
Medomsley			
Pelaw	8	3	,,
Burnhope			
Eighton Moor			
Felling Main			
New Pelton			
Pearth	8	6	,,
South Pelaw			
Waldridge			
Washington Hutton			
South Pearth			
Ramsay's Cannel	16	0	,,
Cowen's Cannel	16	0	,,

DERBYSHIRE.			
Clay Cross, Deep Main, and New Birchwood	8s.6d.	per ton,	
SCOTCH CANNEL.			
Boghead ....at Leith	27	0	,,
Kirkness.....best	23	0	,,
Capeldrae, first quality	20	0	,,
Ditto, second quality	12	6	,,
Lothian	20	0	,,
Lesmahago at Glasgow	23	0	,,
Ditto at Grangemouth	25	0	,,
Arniston	22	0	,,
Wemyss ...(at the pits)	16	0	,,
Bridgeness	17	0	,,
Kinneil			
Knightswood	18	0	,,
Lochgelly	12	6	,,
Lumphinan			
Methill	11	0	,,

FIRE GOODS.

Best Bricks, 60s. per 1000, at Newcastle.
Do. Clay, 14s. per ton do.

LEAD.

Soft pig, £25 to £26 per ton.

WROUGHT IRON TUBING, subject to 25 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto .... ,, 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Flanches	1 9	1 6	1 3	1 0	0 9	
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	
Ditto 1 quart	11 6	10 6	10 3	10 0	9 6	

FREIGHTS, per Ton.

Coastwise—Newcastle.		*Foreign.*	
Chatham & Roches.	8s.0d	Boulogne	9s. 6d
Cork	12 6	Barcelona	37 0
Dover	9 0	Bordeaux	18 0
Dublin	12 6	Calais	9 6
Exeter Quay	9 6	Constantinople	47 0
Folkestone	8 9	Dieppe	10 6
Hastings	12 0	Genoa	39 0
Jersey	11 0	Hamburg	11 6
London	8 6	Havanna	23 6
Lowestoft & Yarmth	5 9	Havre	11 6
Lynn	8 0	Leghorn	38 0
Margate	9 0	Lisbon	17 0
Portsmouth	9 6	Rotterdam	11 6
Plymouth	9 6	Stettin	11 6
Whitstable	8 6	Trieste and Venice	47 0
Weymouth	10 6		